# 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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September 2023

PN: 2022-162

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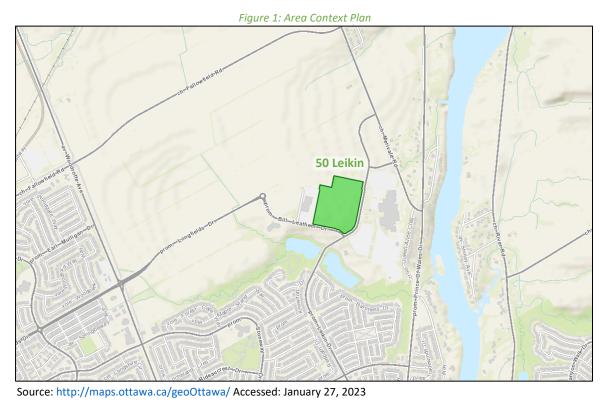
# 1 Screening

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.

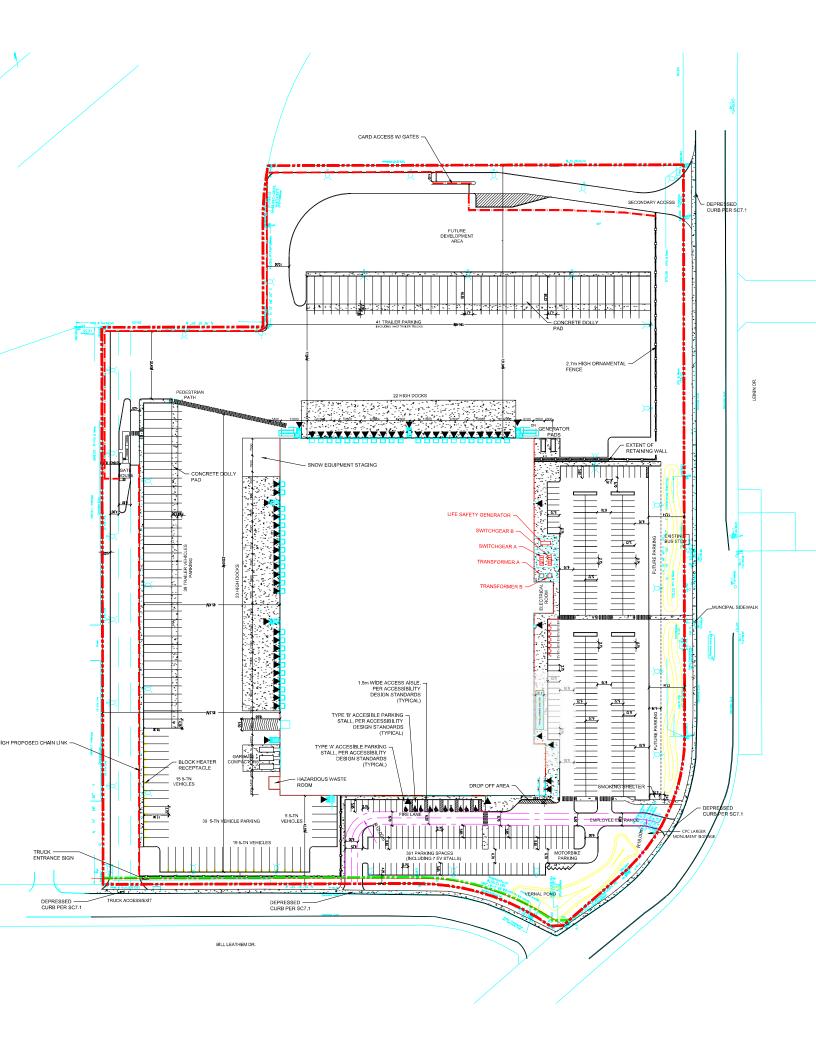
# 2 Existing and Planned Conditions

# 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 361 employee parking spaces, 39 five-tonne truck parking spaces, and 80 trailer parking spaces. The site will facilitate a total of 55 docking doors along the exterior of the building. The proposed access configuration includes a two-way truck access on each Leikin Drive and Bill Leathem Drive and an employee parking access on both roadways. The development will be constructed in a single phase anticipated to be built out by 2026. Figure 1 illustrates the study area context. Figure 2 illustrates the proposed site plan.







# 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 Leathern Drive: Bill Leathern 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 Leathern Drive at Longfields Drive The intersection of Bill Leathern 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

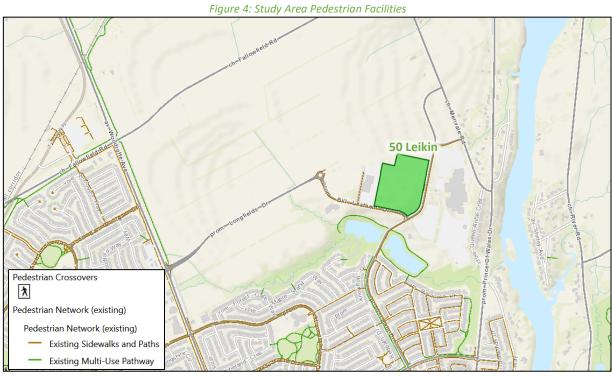
Source: http://maps.ottawa.ca/geoOttawa/ Accessed: January 27, 2023

# Cycling and Pedestrian Facilities

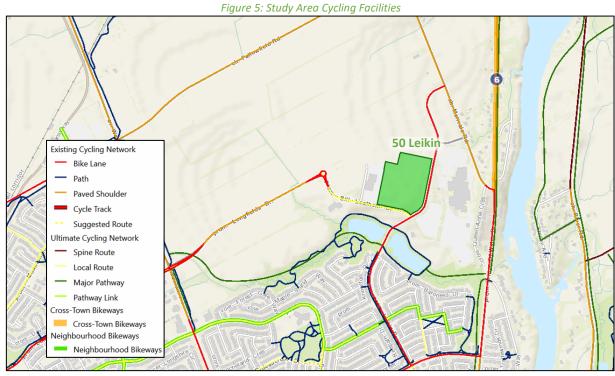
Sidewalks are provided along one side of Bill Leathem Drive, Leikin Drive, and Beckstead Road. A MUP is provided along one side of Leikin Drive south of Holitzner Way and pathways circulate the Clarke Bellinger Stormwater Facility with local neighbourhood connections. Cycling facilities include bike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

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





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



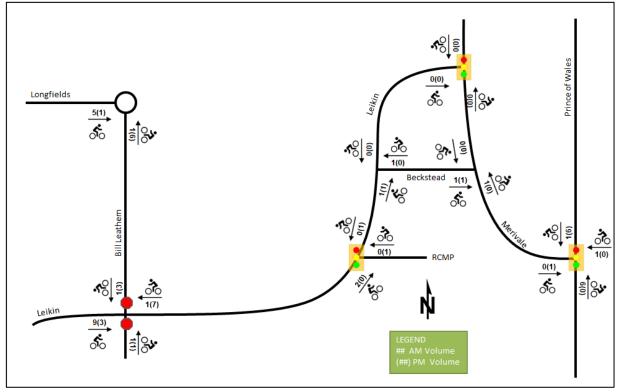
Source: <a href="http://maps.ottawa.ca/geoOttawa/">http://maps.ottawa.ca/geoOttawa/</a> Accessed: January 27, 2023



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Figure 6: Existing Pedestrian Volumes







# 2.2.5 Existing Transit

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

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

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

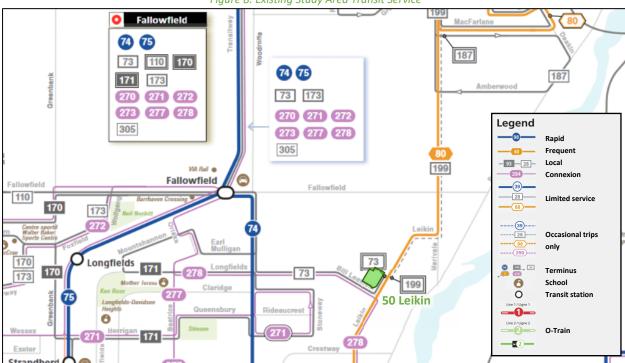


Figure 8: Existing Study Area Transit Service

Source: <a href="http://www.octranspo.com/">http://www.octranspo.com/</a> 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 Leathern 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 Leathern Drive at Leikin Drive. Table 1 summarizes the intersection count dates and sources.

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

Table 1: Intersection Count Date

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 Leathern 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 Leathern 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.

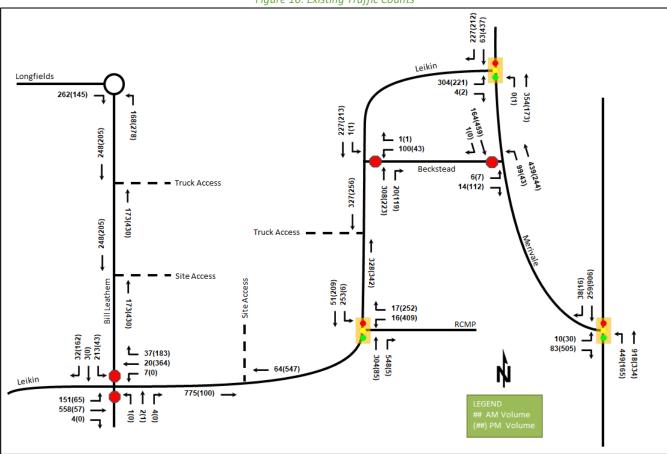


Figure 10: Existing Traffic Counts

Table 2: Existing Intersection Operations

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



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

Notes: Saturation flow rate of 1800 veh/h/lane

Queue is measured in metres

Peak Hour Factor = 0.90

Delay = average vehicle delay in seconds

m = metered queue

# = volume for the 95th %ile cycle exceeds capacity

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

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

### 2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study are road network. Table 3 summarizes the collision



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

Table 3: Study Area Collision Summary, 2016-2020

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

Study Area Bill Leathe Dr 1 - 3 4 - 8 9 - 14 15 - 22 23+ Representation of 2015-2019

Figure 11: Study Area Collision Records



Table 4: Summary of Collision Locations, 2016-2020

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

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

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

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

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

# 2.3 Planned Conditions

# 2.3.1 Changes to the Area Transportation Network

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



# 2.3.2 Other Study Area Developments

### 99 Bill Leathem Drive, 2-20 Leikin Drive

The proposed development application includes a site plan for the construction of an approximately 26,000 square metre light industrial sortation facility. The development is anticipated to be built out by 2026 and to generate 250 AM and 255 PM peak hour auto trips. As part of this development, the north and east legs of the roundabout intersection of Bill Leathern 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)

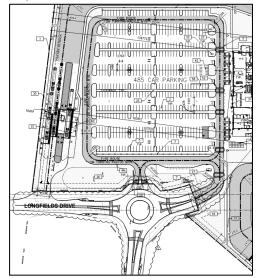


Figure 12: 99 Bill Leathem Drive, 2-20 Leikin Drive TIA - Bill Leathem Drive at Longfields Drive Modifications

### 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:
  - o 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



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

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

### 3.2 Time Periods

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

# 3.3 Horizon Years

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

# 4 Exemption Review

Table 6 summarizes the exemptions for this TIA.

Table 6: Exemption Review

Module	Element	Explanation	Exempt/Required							
Design Review Component  4.1.2 Circulation Only required for site plans Required										
4.1 Development	4.1.2 Circulation and Access	Only required for site plans	Required							
Design	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt							
	4.2.1 Parking Supply	Only required for site plans	Required							
4.2 Parking	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt							
Network Impact Comp	onent									
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required							
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Required							
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt							

# 5 Development-Generated Travel Demand

# 5.1 Mode Shares

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



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

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

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

# 5.2 Trip Generation

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

Table 8: Facility Trip Generation Person Trips

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

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

Table 9: Total Person Trip Generation

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

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

Table 10: Trip Generation by Mode

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



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

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

# 5.3 Trip Distribution

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

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

Table 11: OD Survey Distribution – South Nepean

# 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.



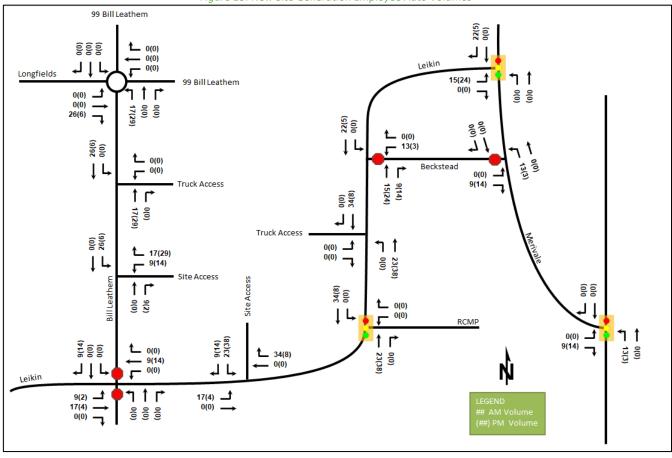


Figure 13: New Site Generation Employee Auto Volumes



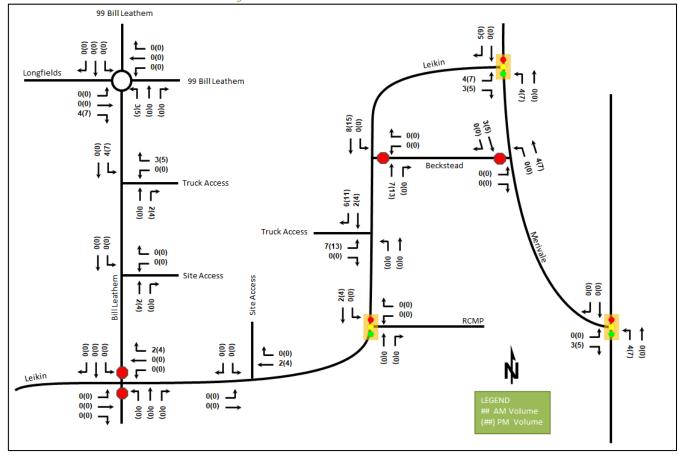


Figure 14: New Site Generation Truck Volumes

# 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 Leathern Drive at Leikin Drive will be constructed and serve as site accesses for the proposed 99 Bill Leathern Drive, 2-20 Leikin Drive development. These approaches are understood to consist of a single shared all-movements lane, and no changes to area traffic beyond the volumes introduced at the site accesses are anticipated.

# 6.2 Background Growth

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

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

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



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

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

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

Table 13: Applied Growth Rates

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

# 6.3 Other Developments

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

# 7 Demand Rationalization

# 7.1 2026 Future Background Operations

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



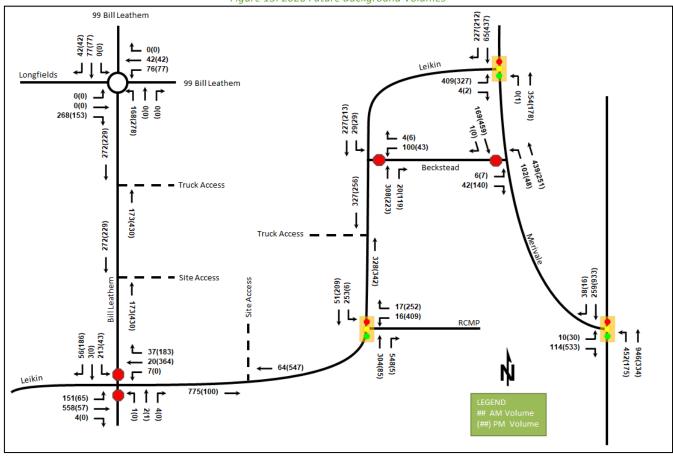


Figure 15: 2026 Future Background Volumes

Table 14: 2026 Future Background Intersection Operations

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



lutava atiava	1		AM Pe	ak Hour		PM Peak Hour				
Intersection	Lane	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	
	EBL	С	0.02	16.4	0.8	С	0.02	15.9	0.8	
Mariticala Dal O	EBR	Α	0.05	9.3	1.5	В	0.23	12.8	6.8	
Merivale Rd & Beckstead Rd	NBL	Α	0.07	7.8	1.5	Α	0.04	8.4	0.8	
Unsignalized	NBT	-	-	-	-	-	-	-	-	
Onsignanzea	SBT/R	-	-	-	-	-	-	-	-	
	Overall	Α	-	1.7	-	Α	-	2.6	-	
	WBL	Α	0.05	26.5	6.8	D	0.86	53.9	#124.8	
	WBR	Α	0.07	13.4	4.9	Α	0.44	6.2	17.5	
Leikin Dr & RCMP Signalized	NBT	Α	0.36	15.8	58.5	Α	0.09	13.3	19.6	
	NBR	Α	0.56	4.3	20.4	Α	0.01	9.0	2.1	
	SBL	Α	0.35	6.0	26.4	Α	0.01	10.5	2.4	
	SBT	Α	0.04	4.8	6.7	Α	0.21	11.6	33.7	
	Overall	Α	0.36	8.1	-	Α	0.45	28.2	-	
	EBL	Α	0.10	7.6	2.3	Α	0.06	8.8	1.5	
	EBT/R	-	-	-	-	-	-	-	-	
Bill Leathem Dr &	WBL	Α	0.01	9.1	0.0	Α	-	0.0	0.0	
Leikin Dr	WBT/R	-	-	-	-	-	-	-	-	
Unsignalized	NB	С	0.02	16.4	0.8	С	0.00	16.4	0.0	
	SB	F	1.00	96.6	76.5	С	0.43	16.6	15.8	
	Overall	D	-	26.1	-	Α	-	4.9	-	
	EBL	Α	0.06	41.8	6.7	Α	0.22	55.5	16.2	
Prince of Wales Dr	EBR	Α	0.45	11.2	10.7	Е	0.97	61.9	#172.4	
& Merivale Rd	NBL	Α	0.51	3.5	34.0	Α	0.30	3.3	11.8	
	NBT	Α	0.57	3.5	115.8	Α	0.22	2.4	22.5	
Signalized	SBT/R	Α	0.13	5.4	22.4	Α	0.50	16.6	83.6	
	Overall	В	0.70	4.5	-	В	0.69	25.7	-	

Notes: Saturation flow rate of 1800 veh/h/lane

Queue is measured in metres

Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds

m = metered queue

# = volume for the 95th %ile cycle exceeds capacity

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

# 7.2 2031 Future Background Operations

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



99 Bill Leathem 227(212) 68(437) 42(42) 77(77) 0(0) - 0(0) - 42(42) - 76(77) Leikin Longfields ∸ 409(327) 99 Bill Leathem 0(0) 0(0) 268(153) 354(187) 0(1) 227(213) 29(29) 0(0) 168(278) 包 272(229) 4(6) 439(264) 102(48) Beckstead 6(7) 327(256) Truck Access 42(140) 20(119) 272(229) Truck Access 328(342) 38(16) 259(981) Site Access 51(209) 253(6) Site Access Bill Leathem 173(430) 17(252) RCMP ↑ 994(334) ↑ 452(184) 10(30) 118(533) 56(186) 3(0) 213(43) ↑ 548(5) ↑ 304(85) 37(183) 20(364) 7(0) - 64(547) Leikin 775(100) 1 1 151(65) 558(57) 4(0) 4(0) 2(1) 1(0)

Figure 16: 2031 Future Background Volumes

Table 15: 2031 Future Background Intersection Operations

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



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

Notes: Saturation flow rate of 1800 veh/h/lane

Queue is measured in metres

Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds

m = metered queue

# = volume for the 95th %ile cycle exceeds capacity

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

# 7.3 2026 Future Total Operations

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



99 Bill Leathem 254(226) 65(437) 42(42) 77(77) 0(0) **–** 0(0) 42(42) Leikin 76(77) Longfields \_ 428(358) 99 Bill Leathem 7(7) 0(0) 0(0) 298(166) ↴ 354(178) 4(8) 172(464) 0(0) 257(233) 29(29) 188(312) 298(235) 4(7) 4(6) ļl ١Ľ 113(46) 443(258) 115(51) **1** 3(5) **←** 0(0) Beckstead ી ા 6(7) 6(11) 363(268) . 29(133) · 330(260) Truck Access 51(154) 1 4 2(4) 190(459) إ لـ 272(229) 26(6) Truck Access 7(13) <u>†</u> 0(0) <u>†</u> ኅ ተ 17(29) 351(380) 0(0) ↴ 9(14) 38(16) 259(933) Site Access 87(221) 253(6) Bill Leathem Site Access 1 1 9(2) 175(434) 17(252) 16(409) RCMP ↑ 946(334) ↑ 469(185) 65(200) 3(0) 213(43) 10(30) 126(552) 9(14) ↑r 39(187) 548(5)327(123) 34(8) 29(378) 66(551) ٦ 4 7(0) Leikin 17(4) <del>1</del>775(100) <del>-</del> ┵ 160(67) 575(61) 4(0) 2(1) 1(0)

Figure 17: 2026 Future Total Volumes

Table 16: 2026 Future Total Intersection Operations

lusta una ati a u	Laura		AM Pe	ak Hour	·		PM Pe	ak Hour	
Intersection	Lane	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
	EB	Α	0.24	5.5	10.2	Α	0.14	5.5	5.7
Bill Leathem Dr &	WB	Α	0.10	0.9	3.4	Α	0.11	1.5	3.8
Longfields Dr	NB	Α	0.11	7.4	4.4	Α	0.18	7.4	7.5
Roundabout	SB	Α	0.11	1.5	3.9	Α	0.12	2.1	4.4
	Overall	Α	0.24	4.6	10.2	Α	0.18	5.1	7.5
	EBL	F	1.01	85.2	#155.9	С	0.80	39.6	#90.2
	EBR	Α	0.03	17.1	3.7	Α	0.03	12.6	2.9
Merivale Rd &	NBL	Α	0.01	8.8	1.8	Α	0.03	11.1	3.0
Leikin Dr	NBT	Α	0.33	10.8	54.5	Α	0.20	10.8	28.6
Signalized	SBT	Α	0.07	8.7	11.6	Α	0.46	13.6	73.6
	SBR	Α	0.26	1.9	10.0	Α	0.25	2.6	10.9
	Overall	Α	0.54	37.3	-	Α	0.57	18.8	-
	WBL	С	0.27	16.8	8.3	В	0.10	14.1	2.3
Lattice Doc 0	WBR	В	0.01	10.2	0.0	В	0.01	10.1	0.0
Leikin Dr &	NBT/R	-	-	-	-	-	-	-	-
Beckstead Rd	SBL	Α	0.02	8.1	0.8	Α	0.03	8.2	0.8
Unsignalized	SBT	-	-	-	-	-	-	-	-
	Overall	Α	-	2.8	-	Α	-	1.3	-



Intersection	Lane		AM Pe	eak Hour		PM Peak Hour				
intersection	Laile	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup>	
	EBL	С	0.02	17.0	0.8	С	0.02	16.3	0.8	
Marinala Dd 9	EBR	Α	0.06	9.4	1.5	В	0.26	13.1	7.5	
Merivale Rd &	NBL	Α	0.08	7.8	2.3	Α	0.05	8.4	0.8	
Beckstead Rd Unsignalized	NBT	-	-	-	-	-	-	-	-	
Unsignanzea	SBT/R	-	-	-	-	-	-	-	-	
	Overall	Α	-	1.9	-	Α	-	2.7	-	
	WBL	Α	0.05	26.5	6.8	D	0.86	53.9	#124.8	
	WBR	Α	0.07	13.4	4.9	Α	0.44	6.2	17.5	
Lattin Du G DOMD	NBT	Α	0.38	16.0	63.2	Α	0.13	13.3	26.8	
Leikin Dr & RCMP	NBR	Α	0.56	4.3	20.4	Α	0.01	9.0	2.1	
Signalized	SBL	Α	0.36	6.1	26.4	Α	0.01	10.5	2.4	
	SBT	Α	0.07	4.7	10.1	Α	0.22	11.7	35.6	
	Overall	Α	0.37	8.2	-	Α	0.46	27.5	-	
	EBL	Α	0.11	7.6	2.3	Α	0.07	8.8	1.5	
	EBT/R	-	-	-	-	-	-	-	-	
Bill Leathem Dr &	WBL	Α	0.01	9.2	0.0	Α	-	0.0	0.0	
Leikin Dr	WBT/R	-	-	-	-	-	-	-	-	
Unsignalized	NB	С	0.02	17.1	0.8	С	0.00	16.8	0.0	
Š	SB	F	1.09	122.6	87.8	С	0.46	17.6	18.0	
	Overall	D	-	32.6	-	Α	-	5.2	-	
	EBL	Α	0.06	41.8	6.7	Α	0.22	55.5	16.2	
	EBR	Α	0.46	10.8	11.1	F	1.02	72.8	#183.8	
Prince of Wales Dr	NBL	Α	0.53	3.7	35.8	Α	0.32	3.5	12.6	
& Merivale Rd	NBT	Α	0.57	3.5	115.8	Α	0.22	2.4	22.5	
Signalized	SBT/R	A	0.13	5.6	22.8	A	0.50	16.6	83.6	
	Overall	В	0.70	4.6	-	C	0.71	28.2	-	
	WBL/R	В	0.01	10.5	0.0	В	0.01	13.3	0.0	
Bill Leathem Dr &	NBT/R		-		-		-	-	-	
Site Trucks	SBL/T	Α	0.00	8.8	0.0	Α	0.01	10.0	0.0	
Unsignalized	Overall	A	-	0.1	-	A	-	0.2	-	
	WBL/R	В	0.04	10.3	0.8	В	0.08	12.3	2.3	
Bill Leathem Dr &	NBT/R	-	-	-	-	-	-	-		
Site Employees	SBL/T	Α	0.02	7.6	0.8	Α	0.01	8.2	0.0	
Unsignalized	Overall	A	-	0.9	-	A	-	0.8	-	
	EBL/R	C	0.03	18.1	0.8	C	0.04	17.1	0.8	
Leikin Dr & Site	NBL/T	-	-	-	-	-	-	-	-	
Trucks	SBT/R		-	-	_		_	-		
Unsignalized	Overall	Α	_	0.2	-	Α	_	0.3		
	EBL/T	A		7.4	0.0	<u>А</u> А	0.00	8.6	0.0	
Leikin Dr & Site	-		0.01			A			0.0	
<b>Employees</b>	WBT/R	- D	- 0.06	11.6	- 1 F		- 0.11	12.0	-	
Unsignalized	SBL/R	В	0.06	11.6	1.5	В	0.11	13.8	3.0	
Notes: Saturation flo	Overall	Α	-	0.7	Delay = average	Α	-	1.0	-	

Queue is measured in metres Peak Hour Factor = 1.00

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 Leathern 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 95<sup>th</sup> percentile queue due to site traffic being 11.3 metres, or less than two car-lengths.

# 2031 Future Total Operations

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

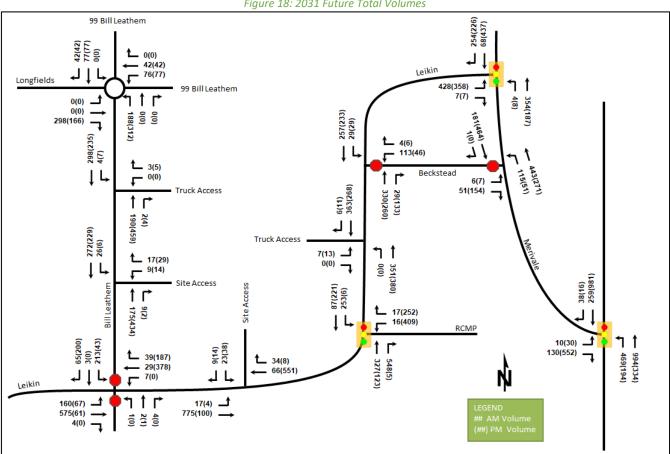


Figure 18: 2031 Future Total Volumes



Table 17: 2031 Future Total Intersection Operations

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



lutava atiav			AM Pe	ak Hour			PM Pe	ak Hour	
Intersection	Lane	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
	WBL/R	В	0.01	10.5	0.0	В	0.01	13.3	0.0
Bill Leathem Dr &	NBT/R	-	-	-	-	-	-	-	-
Site Trucks <i>Unsignalized</i>	SBL/T	Α	0.00	8.8	0.0	Α	0.01	10.0	0.0
Unsignanzea	Overall	Α	-	0.1	-	Α	-	0.2	-
Bill Leathem Dr &	WBL/R	В	0.04	10.3	0.8	В	0.08	12.3	2.3
	NBT/R	-	-	-	-	-	-	-	-
Site Employees Unsignalized	SBL/T	Α	0.02	7.6	0.8	Α	0.01	8.2	0.0
Unsignanzea	Overall	Α	-	0.9	-	Α	-	0.8	-
	EBL/T	Α	0.01	7.4	0.0	Α	0.00	8.6	0.0
Leikin Dr & Site	WBT/R	-	-	-	-	-	-	-	-
Employees	SBL/R	В	0.06	11.6	1.5	В	0.11	13.8	3.0
Unsignalized	Overall	Α	-	0.7	-	Α	-	1.0	-
Lattin Da O Cita	EBL/R	С	0.03	18.1	0.8	С	0.04	17.1	0.8
Leikin Dr & Site Trucks Unsignalized	NBL/T	-	-	-	-	-	-	-	-
	SBT/R	-	-	-	-	-	-	-	-
	Overall	Α	-	0.2	-	Α	-	0.3	-

Notes: Saturation flow rate of 1800 veh/h/lane

Peak Hour Factor = 1.00

Queue is measured in metres

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.

# Modal Share Sensitivity and Demand Rationalization Conclusions

# 7.5.1 Rationalization of Network Travel Demand

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

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

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



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

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

Table 18: 2031 Future Total Intersection Operations - Bill Leathern Drive at Leikin Drive with AWSC

Intersection	Lane		AM Pea	ak Hour		PM Peak Hour				
		LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	
Bill Leathem Dr & Leikin Dr Unsignalized	EBL	В	0.27	11.1	8.3	Α	0.12	10.0	3.0	
	EBT/R	Е	0.89	37.5	82.5	Α	0.10	9.5	2.3	
	WBL	В	0.01	10.2	0.0	-	-	-	-	
	WBT/R	Α	0.12	10.0	3.0	D	0.81	26.4	63.8	
	NB	Α	0.01	9.3	0.0	Α	0.00	9.3	0.0	
	SB	В	0.46	13.8	18.0	В	0.36	11.3	12.0	
	Overall	D	-	25.6	-	С	-	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 Leathern drive at the site access for the 61 Bill Leathern 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 Leathern Drive on the west side of the parcel and a two-way full-movement truck access on Leikin Drive opposite the RCMP campus visitor parking access. Each access connects to the truck parking lots and facility docks.

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

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

# 9 Parking

# 9.1 Parking Supply

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

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

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

# 10 Boundary Street Design

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

Table 19: Boundary Street MMLOS Analysis

1 4 5 6 5 7 5 6 6 6 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1										
Cogmont	Pedest	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		
Segment	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target		
Leikin Drive (Existing)	F	С	С	С	-	-	В	В		
Leikin Drive (Future)	D	С	С	С	-	-	В	В		
Bill Leathem Drive (Existing)	F	С	D	С	-	-	В	В		



Cogmont	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
Segment	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Bill Leathem Drive (Future)	Е	С	D	С	-	-	В	В

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 Leathern Drive. To meet the theoretical bicycle LOS targets along Bill Leathern Drive, a curbside bike lane would be required at a minimum.

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

# 11 Access Intersections Design

# 11.1 Location and Design of Access

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

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

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

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



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

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

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

#### 11.2 Intersection Control

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

#### 11.3 Access Intersection Design

#### 11.3.1 Future Access Intersection Operations

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

#### 11.3.2 Access Intersection MMLOS

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

#### 11.3.3 Recommended Design Elements

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

## 12 Transportation Demand Management

#### 12.1 Context for TDM

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

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

#### 12.2 Need and Opportunity

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

#### 12.3 TDM Program

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

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



# 13 Neighbourhood Traffic Management

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

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

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

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

#### 14 Transit

#### 14.1 Route Capacity

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 20 summarizes the transit trip generation.

Table 20: Trip Generation by Transit Mode

Tuescal Manda	<b>Employees Mode</b>		PM Peak Hour					
Travel Mode	Share	In	Out	Total	In	Out	Total	
Transit	5%	5	4	9	1	6	7	

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

#### 14.2 Transit Priority

No transit priority is required explicitly for this study.

# 15 Network Intersection Design

#### 15.1 Network Intersection Control

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



#### 15.2 Network Intersection Design

#### 15.2.1 Future Total Network Intersection Operations

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

#### 15.2.2 Network Intersection MMLOS

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

		Tuble 21:	Study Aret	ımtersecti	OII IVIIVILUS	Ariulysis				
Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
intersection	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Merivale Rd & Leikin Dr	F	С	F	В	N/A	N/A	С	D	Α	D
Prince of Wales Dr & Merivale Rd	F	С	В	В	N/A	N/A	С	D	С	D

Table 21: Study Area Intersection MMLOS Analysis

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

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

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

#### 15.2.3 Recommended Design Elements

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

# 16 Summary of Improvements Indicated and Modifications Options

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

#### **Proposed Site and Screening**

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

#### **Existing Conditions**

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



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

#### **Development Generated Travel Demand**

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

#### **Background Conditions**

- The north and east legs of the roundabout intersection of Bill Leathem Drive at Leikin Drive will be constructed and serve as site accesses for the proposed 99 Bill Leathem Drive, 2-20 Leikin Drive development
- All growth on Longfields Drive, Bill Leathem Drive, and Leikin Drive is assumed to be associated with future development within this area which can explicitly be accounted for by incorporated forecasted volumes from area traffic studies
- Growth rates of 1.00% have been applied to mainline movements and major turning movements along Merivale Road and Prince of Wales Drive during the AM peak hour and reversed in the PM peak hour
- Capacity issues have been noted on the eastbound left-turn movement at the intersection of Merivale Road at Leikin Drive during the AM peak hour, on the eastbound right-turn movement at the intersection of Prince of Wales Drive at Merivale Road during the PM peak hour, and on the southbound approach at the intersection of Bill Leathern 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 Leathern 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 Leathern Drive
- Transit stops are provided on both sides of Leikin Drive at the RCMP campus access intersection, and on both sides of Bill Leathern drive at the site access for the 61 Bill Leathern Drive parcel
- The site is proposed as having a two-way full-movement truck access on Bill Leathem Drive on the west side of the parcel and a two-way full-movement truck access on Leikin Drive opposite the RCMP campus visitor parking access
- A two-way full-movement access for employees is proposed each on Bill Leathem Drive roughly in the centre of the parcel, and on Leikin Drive between Bill Leathem Drive and the RCMP campus access for site employees
- Emergency services are anticipated to access the site via the employee access
- Waste collection is to occur within the western vehicle parking yard and the truck yards, drive aisles, and accesses have been designed to accommodate line haul trucks

#### **Parking**

- The development is proposed as providing 361 vehicle parking spaces
- Bicycle parking spaces are provided within a sheltered area Parking for 80 line haul truck trailers, and parking for 39 five-tonne trucks are proposed on site connecting to the truck accesses on Leikin Drive and Bill Leathern 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 Leathern Drive, but the provision of a bike lane on Bill Leathern 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 Leathern 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
  - o 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 Leathern 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
Accesses	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	No		
Bicycle Networks?			
Is the development in a Design Priority Area (DPA) or Transit-oriented	No		
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	No			
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,	Yes			
or within 150 m of intersection in urban/ suburban conditions)?				
Is the proposed driveway within auxiliary lanes of an intersection?	No			
Does the proposed driveway make use of an existing median break that	NI-			
serves an existing site?	No			
Is there is a documented history of traffic operations or safety concerns on	No			
the boundary streets within 500 m of the development?	No			
Does the development include a drive-thru facility?	No			
Safety Trigger	Yes			



#### **TIA Plan Reports**

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

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

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

#### **CERTIFICATION**

- 1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
- 2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
- 3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
- 4. I am either a licensed<sup>1</sup> or registered<sup>2</sup> professional in good standing, whose field of expertise [check  $\sqrt{\text{appropriate field(s)}}$ ] is either transportation engineering  $\sqrt{\text{or}}$  or transportation planning  $\square$ .
- License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

Dated at Ottawa (City)	this 20 day of September	, 2018
Name:	Andrew Harte	
Ivame.	(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** 





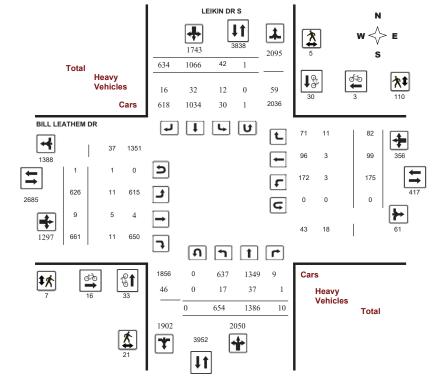
#### **Turning Movement Count - Study Results**

#### 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**

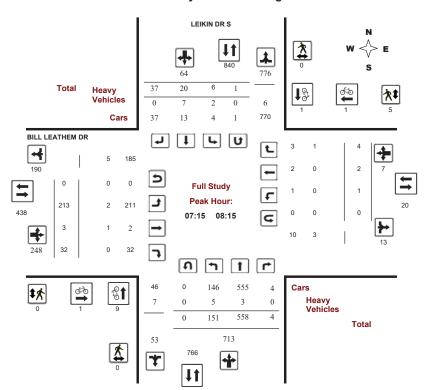
## **Turning Movement Count - Study Results**

#### 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**



February 12, 2020 Page 1 of 8 February 12, 2020 Page 2 of 8

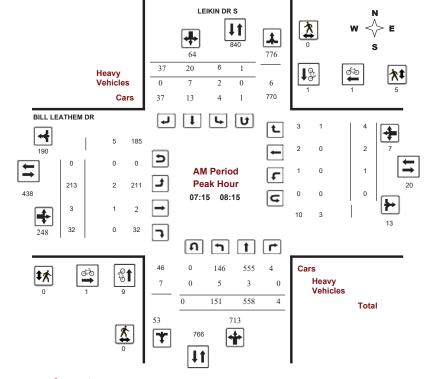


#### **Turning Movement Count - Peak Hour Diagram**

#### BILL LEATHEM DR @ LEIKIN DR S

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

 Start Time:
 07:00
 Device:
 Miovision



Comments



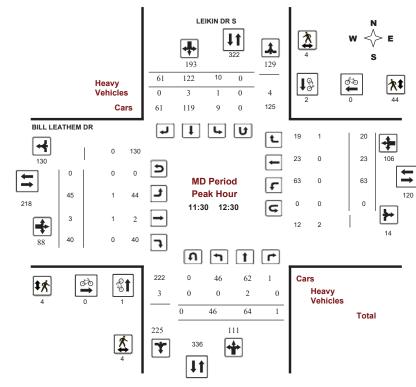
#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Peak Hour Diagram**

#### BILL LEATHEM DR @ LEIKIN DR S

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

 Start Time:
 07:00
 Device:
 Miovision



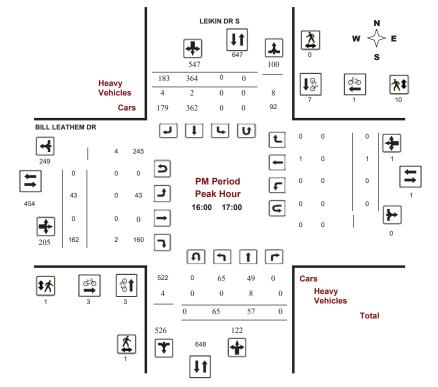
Comments



#### **Turning Movement Count - Peak Hour Diagram**

#### BILL LEATHEM DR @ LEIKIN DR S

Survey Date: Wednesday, June 12, 2019 WO No: 38659 Start Time: 07:00 Device: Miovision



Comments



#### **Transportation Services - Traffic Services**

# **Turning Movement Count - Study Results**

#### BILL LEATHEM DR @ LEIKIN DR \$

Survey Date: Wednesday, June 12, 2019 WO No: 38659 Start Time: 07:00 Device: Miovision

#### Full Study Summary (8 HR Standard)

Survey Date: Wednesday, June 12, 2019 **Total Observed U-Turns AADT Factor** Southbound: 1.25

> Eastbound: Westbound: 0

LEIKIN DR S BILL LEATHEM DR Northbound Southbound Eastbound Westbound LT ST RT ST RT ST RT ST RT Period LT LT TOT TOT TOT Total 08:00 09:00 32 627 236 863 09:00 10:00 424 11:30 12:30 12:30 13:30 392 15:00 16:00 329 428 745 16:00 17:00 17:00 18:00 242 90 332 465 187 225 690 654 1386 10 2050 1066 634 1742 3792 626 661 1296 175 82 356 1652 5444 Sub Total 42 99 U Turns 661 1297 5446 Total 654 1386 10 2050 42 1066 634 1743 3793 626 9 175 99 82 356 1653 114 EQ 12Hr 909 14 2850 1482 881 2423 5272 243 1927 58 1.39 Note: These values are calculated by multiplying the totals by the appropriate expansion factor. 13 53 1334 793 2180 103 6813 Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor 0.9 AVG 24Hr 134 2709 8925 1747 1039 2856 6216 15 1083 **2126** 287 162 Note: These volumes are calculated by multiplying the Average Daily 12 hr, totals by 12 to 24 expansion factor.

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

2020-Feb-12 Page 3 of 3 Page 3 of 8

February 12, 2020



#### **Turning Movement Count - Study Results**

#### BILL LEATHEM DR @ LEIKIN DR S

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

 Start Time:
 07:00
 Device:
 Miovision

#### Full Study 15 Minute Increments

LEIKIN DR S BILL LEATHEM DR

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

Note: U-Turns are included in Totals.



#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results**

#### BILL LEATHEM DR @ LEIKIN DR S

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

 Start Time:
 07:00
 Device:
 Miovision

#### **Full Study Cyclist Volume**

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

February 12, 2020 Page 4 of 8 February 12, 2020 Page 5 of 8



#### **Turning Movement Count - Study Results**

#### BILL LEATHEM DR @ LEIKIN DR S

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

 Start Time:
 07:00
 Device:
 Miovision

#### **Full Study Pedestrian Volume**

LEIKIN DR S BILL LEATHEM DR

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



#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results**

#### BILL LEATHEM DR @ LEIKIN DR S

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

 Start Time:
 07:00
 Device:
 Miovision

#### **Full Study Heavy Vehicles**

LEIKIN DR S	BILL LEATHEM DR
-------------	-----------------

	N	orthbo	und		So	outhbou	nd		Eastbound					We	estbour	nd			
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR	Grand Total
07:00 07:15	1	0	0	2	0	1	0	1	3	0	0	0	1	0	0	0	0	1	2
07:15 07:30	1	2	0	3	1	0	0	4	7	0	1	0	2	0	0	1	3	5	6
07:30 07:45	1	0	0	3	0	2	0	3	6	1	0	0	2	0	0	0	0	2	4
07:45 08:00	1	1	0	4	0	2	0	3	7	0	0	0	1	0	0	0	0	1	4
08:00 08:15	2	0	0	5	1	3	0	5	10	1	0	0	3	0	0	0	1	4	7
08:15 08:30	2	1	0	7	1	4	0	8	15	1	2	0	6	0	1	1	5	11	13
08:30 08:45	1	0	0	3	2	1	1	8	11	2	0	1	6	0	1	2	5	11	11
08:45 09:00	1	1	0	4	1	2	1	8	12	2	0	0	6	0	0	1	2	8	10
09:00 09:15	0	1	1	4	0	1	0	4	8	0	0	0	0	1	0	2	4	4	6
09:15 09:30	0	1	0	2	1	0	0	4	6	1	0	0	1	1	0	1	3	4	5
09:30 09:45	0	1	0	2	1	1	0	4	6	1	0	0	1	0	0	0	1	2	4
09:45 10:00	0	1	0	3	0	2	0	4	7	1	0	0	2	0	1	0	1	3	5
11:30 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 12:00	0	1	0	2	0	1	0	3	5	1	1	0	2	0	0	0	1	3	4
12:00 12:15	0	0	0	1	0	1	0	1	2	0	0	0	0	0	0	0	0	0	1
12:15 12:30	0	1	0	2	1	1	0	4	6	0	0	0	0	0	0	1	2	2	4
12:30 12:45	1	0	0	2	1	0	0	1	3	0	0	1	2	0	0	0	1	3	3
12:45 13:00	0	2	0	4	2	1	0	6	10	0	0	1	1	0	0	1	3	4	7
13:00 13:15	0	0	0	2	0	2	0	2	4	0	0	0	0	0	0	0	0	0	2
13:15 13:30	0	1	0	1	0	0	0	2	3	0	0	0	0	0	0	1	1	1	2
15:00 15:15	3	2	0	9	0	1	1	4	13	0	1	2	7	1	0	0	2	9	11
15:15 15:30	1	1	0	3	0	1	2	4	7	0	0	0	3	0	0	0	0	3	5
15:30 15:45	0	2	0	2	0	0	1	3	5	0	0	0	1	0	0	0	0	1	3
15:45 16:00	1	4	0	7	0	1	1	6	13	0	0	1	3	0	0	0	0	3	8
16:00 16:15	0	3	0	4	0	0	1	4	8	0	0	1	2	0	0	0	0	2	5
16:15 16:30	0	1	0	1	0	0	2	3	4	0	0	0	2	0	0	0	0	2	3
16:30 16:45	0	2	0	4	0	1	1	4	8	0	0	1	2	0	0	0	0	2	5
16:45 17:00	0	2	0	3	0	1	0	3	6	0	0	0	0	0	0	0	0	0	3
17:00 17:15	1	1	0	2	0	0	2	3	5	0	0	0	3	0	0	0	0	3	4
17:15 17:30	0	2	0	3	0	0	1	3	6	0	0	1	2	0	0	0	0	2	4
17:30 17:45	0	2	0	5	0	1	2	5	10	0	0	2	4	0	0	0	0	4	7
17:45 18:00	0	1	0	2	0	1	0	2	4	0	0	0	0	0	0	0	0	0	2
Total: None	17	37	1	101	12	32	16	119	220	11	5	11	65	3	3	11	35	100	160

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#### **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

		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



#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results**

#### BILL LEATHEM DR @ LONGFIELDS DR

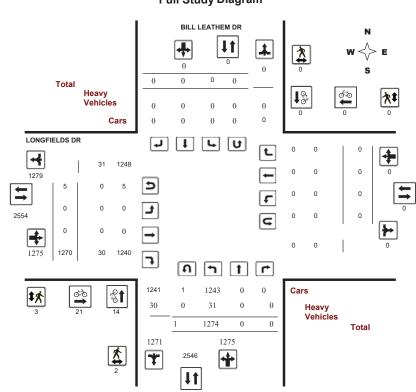
Survey Date: Wednesday, June 10, 2015 WO No:

Start Time: 07:00

WO No: 35082

Device: Miovision

#### **Full Study Diagram**



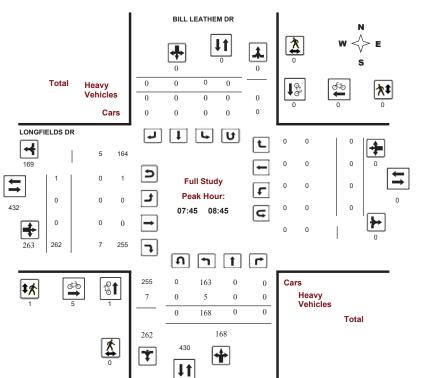
February 12, 2020 Page 8 of 8 March 26, 2020 Page 1 of 8



#### **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



March 26, 2020 Page 2 of 8



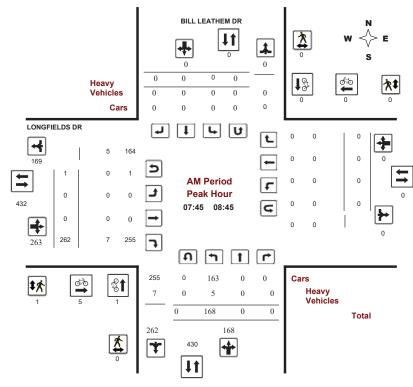
#### **Transportation Services - Traffic Services**

#### **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

2020-Mar-26 Page 1 of 3

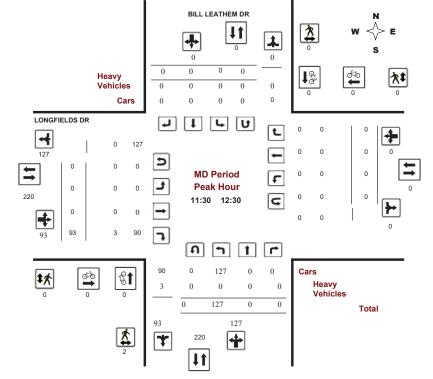


#### **Turning Movement Count - Peak Hour Diagram**

#### BILL LEATHEM DR @ LONGFIELDS DR

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

 Start Time:
 07:00
 Device:
 Miovision



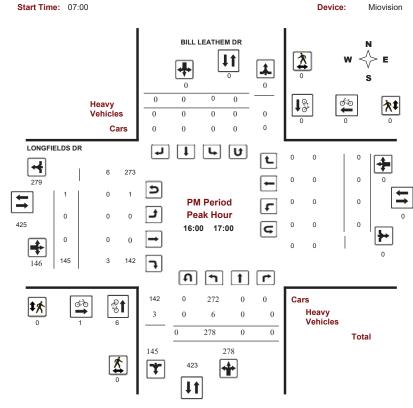
Comments



#### **Transportation Services - Traffic Services**

# Turning Movement Count - Peak Hour Diagram BILL LEATHEM DR @ LONGFIELDS DR

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



Comments



#### **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

Eastbound: 5 Westbound: 0

		В	ILL L	EATHE	M DR							LON	GFIELI	OS DR					
	Nor	thbour	nd		Sou	ıthbou	nd			E	astbou	und		W	estbou	ınd			
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	123	0	0	123	0	0	0	0	123	0	0	231	231	0	0	0	0	231	354
08:00 09:00	159	0	0	159	0	0	0	0	159	0	0	255	255	0	0	0	0	255	414
09:00 10:00	89	0	0	89	0	0	0	0	89	0	0	141	141	0	0	0	0	141	230
11:30 12:30	127	0	0	127	0	0	0	0	127	0	0	93	93	0	0	0	0	93	220
12:30 13:30	66	0	0	66	0	0	0	0	66	0	0	117	117	0	0	0	0	117	183
15:00 16:00	210	0	0	210	0	0	0	0	210	0	0	128	128	0	0	0	0	128	338
16:00 17:00	278	0	0	278	0	0	0	0	278	0	0	145	145	0	0	0	0	145	423
17:00 18:00	222	0	0	222	0	0	0	0	222	0	0	160	160	0	0	0	0	160	382
Sub Total	1274	0	0	1274	0	0	0	0	1274	0	0	1270	1270	0	0	0	0	1270	2544
U Turns				1				0	1				5				0	5	6
Total	1274	0	0	1275	0	0	0	0	1275	0	0	1270	1275	0	0	0	0	1275	2550
EQ 12Hr	1771	0	0	1772	0	0	0	0	1772	0	0	1765	1772	0	0	0	0	1772	3544
Note: These	values are	e calcul	ated by	/ multiply	ing the	totals b	y the ap	opropriate	e expansi	on facto	or.			1.39					
AVG 12Hr	1502	0	0	1503	0	0	0	0	1595	0	0	1497	1503	0	0	0	0	1595	3190
Note: These	volumes a	are calc	ulated	by multip	lying th	e Equiv	alent 12	2 hr. total	ls by the	AADT f	actor.			0.9					
AVG 24Hr	1968	0	0	1969	0	0	0	0	1969	0	0	1962	1969	0	0	0	0	1969	3938
Note: These	volumes a	are calc	ulated	by multir	olvina th	e Avera	ge Dail	v 12 hr. 1	totals by	12 to 24	l expan	sion fac	ctor.	1.31					

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

1.31

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



#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results**

#### BILL LEATHEM DR @ LONGFIELDS DR

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

 Start Time:
 07:00
 Device:
 Miovision

#### Full Study 15 Minute Increments

BILL LEATHEM DR LONGFIELDS DR

		N	orthbo	und		Sc	outhbou	ınd			E	astboui	nd		We	estbour	nd			
07:15   07:30   28   0   0   28   0   0   0   28   0   0   0   0   0   0   0   0   0	Time Period	LT	ST	RT	N TOT	LT	ST	RT			LT	ST	RT	E TOT	LT	ST	RT			
07:30 07:45 52 0 0 0 32 0 0 0 0 0 0 0 1 0 0 0 1 1 0 0 0 57 57 0 0 0 0 0 1 1 89 07:45 08:00 39 0 0 0 39 0 0 0 0 0 0 0 0 0 0 0 0 0	07:00 07:15	24	0	0	24	0	0	0	0	0	0	0	45	45	0	0	0	0	0	69
07:45 08:00 08:06 39 0 0 0 39 0 0 0 0 0 0 0 0 0 0 0 0 0 71 72 0 0 0 0 0 0 0 111 08:00 08:16 44 0 0 0 44 0 0 0 0 0 0 0 0 1 0 0 0 57 57 67 0 0 0 0 0 0 4 101 08:15 08:30 45 0 0 0 45 0 0 0 0 0 0 0 0 0 0 0 0 0	07:15 07:30	28	0	0	28	0	0	0	0	0	0	0	58	58	0	0	0	0	0	86
08:00 08:15	07:30 07:45	32	0	0	32	0	0	0	0	1	0	0	57	57	0	0	0	0	1	89
08:15 08:30 45 0 0 0 45 0 0 0 0 0 0 0 0 0 0 0 0 0	07:45 08:00	39	0	0	39	0	0	0	0	0	0	0	71	72	0	0	0	0	0	111
08:30 08:45 40 0 0 0 40 0 0 0 0 0 0 0 0 0 0 0 0 0	08:00 08:15	44	0	0	44	0	0	0	0	4	0	0	57	57	0	0	0	0	4	101
08:45 09:00 30 0 0 0 30 0 0 0 30 0 0 0 0 0 0 0 0	08:15 08:30	45	0	0	45	0	0	0	0	1	0	0	66	66	0	0	0	0	1	111
09:00 09:15 31 0 0 0 31 0 0 0 0 0 0 1 0 0 0 55 55 55 0 0 0 0 0	08:30 08:45	40	0	0	40	0	0	0	0	0	0	0	68	68	0	0	0	0	0	108
09:15	08:45 09:00	30	0	0	30	0	0	0	0	2	0	0	64	64	0	0	0	0	2	94
09:30	09:00 09:15	31	0	0	31	0	0	0	0	1	0	0	55	55	0	0	0	0	1	86
09:45 10:00 11 0 0 0 11 0 0 0 0 0 0 0 0 0 1 0 0 0 17 17 0 0 0 0	09:15 09:30	16	0	0	16	0	0	0	0	1	0	0	40	41	0	0	0	0	1	57
11:30	09:30 09:45	31	0	0	31	0	0	0	0	2	0	0	29	29	0	0	0	0	2	60
11:45         12:00         33         0         0         33         0 <td< td=""><td>09:45 10:00</td><td>11</td><td>0</td><td>0</td><td>11</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>17</td><td>17</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>28</td></td<>	09:45 10:00	11	0	0	11	0	0	0	0	1	0	0	17	17	0	0	0	0	1	28
12:00 12:15 35 0 0 0 35 0 0 0 0 0 0 0 0 0 0 26 26 0 0 0 0 0 0 0	11:30 11:45	38	0	0	38	0	0	0	0	0	0	0	20	20	0	0	0	0	0	58
12:15 12:30 21 0 0 0 21 0 0 0 0 0 0 0 0 0 0 24 24 0 0 0 0 0 0 45 12:30 12:45 17 0 0 0 17 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11:45 12:00	33	0	0	33	0	0	0	0	0	0	0	23	23	0	0	0	0	0	56
12:30	12:00 12:15	35	0	0	35	0	0	0	0	0	0	0	26	26	0	0	0	0	0	61
12:45         13:00         17         0         0         17         0         0         17         0         0         17         0         0         17         0	12:15 12:30	21	0	0	21	0	0	0	0	0	0	0	24	24	0	0	0	0	0	45
13:00         13:15         14         0         0         14         0         0         0         0         0         0         23         24         0         0         0         0         38           13:15         13:30         18         0         0         18         0 <td>12:30 12:45</td> <td>17</td> <td>0</td> <td>0</td> <td>17</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>39</td> <td>39</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>56</td>	12:30 12:45	17	0	0	17	0	0	0	0	0	0	0	39	39	0	0	0	0	0	56
13:15         13:30         18         0         0         18         0         0         18         0         0         10         <	12:45 13:00	17	0	0	17	0	0	0	0	1	0	0	35	35	0	0	0	0	1	52
15:00 15:15 50 0 0 0 50 0 0 0 0 0 0 2 0 0 2 77  15:15 15:30 41 0 0 0 41 0 0 0 0 0 0 2 0 0 30 31 0 0 0 0 0 2 72  15:35 16:30 44 0 0 0 55 0 0 0 0 0 0 0 0 0 0 0 0 0	13:00 13:15	14	0	0	14	0	0	0	0	0	0	0	23	24	0	0	0	0	0	38
15:15         15:30         41         0         0         41         0         0         0         0         2         0         0         30         31         0         0         0         0         2         72           15:30         15:45         55         0         0         55         0         0         0         0         0         42         42         0         0         0         0         3         97           15:45         16:00         64         0         0         64         0         0         0         1         0         0         29         29         0         0         0         0         1         93           16:00         16:15         87         0         0         87         0         0         0         0         2         0         0         0         0         0         2         122           16:15         16:30         59         0         0         0         0         0         0         33         3         0         0         0         0         98           16:30         16:45         64         0	13:15 13:30	18	0	0	18	0	0	0	0	0	0	0	20	20	0	0	0	0	0	38
15:30         15:45         55         0         0         55         0         0         0         0         0         42         42         0         0         0         3         97           15:45         16:00         64         0         0         64         0         0         0         0         1         0         0         29         29         0         0         0         0         1         93           16:00         16:15         87         0         0         87         0	15:00 15:15	50	0	0	50	0	0	0	0	2	0	0	27	27	0	0	0	0	2	77
15:45 16:00 64 0 0 64 0 0 0 64 0 0 0 0 0 1 0 0 29 29 0 0 0 0 0 1 93 16:00 16:15 87 0 0 87 0 0 0 87 0 0 0 0 0 2 0 0 35 35 0 0 0 0 0 0 2 122 16:00 16:15 16:30 59 0 0 0 59 0 0 0 0 0 0 0 0 0 0 0 38 39 0 0 0 0 0 0 98 16:30 16:45 64 0 0 0 64 0 0 0 0 0 3 3 0 0 0 3 31 31 0 0 0 0 0 3 3 95 16:45 17:00 68 0 0 68 0 0 0 68 0 0 0 0 1 0 0 0 1 0 0 0 1 1 0 0 0 1 1 109 17:00 17:15 70 0 0 70 0 0 70 0 0 0 0 0 0 0 0 0 0 0	15:15 15:30	41	0	0	41	0	0	0	0	2	0	0	30	31	0	0	0	0	2	72
16:00 16:15 87 0 0 0 87 0 0 0 0 0 2 0 0 35 35 0 0 0 0 0 0 2 122 16:15 16:30 59 0 0 59 0 0 0 59 0 0 0 0 0 0 3 3 3 39 0 0 0 0 0 0 98 16:30 16:45 64 0 0 64 0 0 0 64 0 0 0 0 3 3 0 0 31 31 0 0 0 0 0 3 3 95 16:45 17:00 68 0 0 68 0 0 68 0 0 0 0 1 0 0 1 0 0 1 1 0 0 0 1 1 109 17:00 17:15 70 0 0 70 0 0 70 0 0 0 0 0 1 0 0 0 37 37 0 0 0 0 0 0 1 109 17:15 17:30 57 0 0 0 52 0 0 0 0 0 1 1 0 0 44 44 0 0 0 0 0 0 1 102 17:30 17:45 52 0 0 52 0 0 0 52 0 0 0 0 0 2 0 0 44 44 0 0 0 0 0 0 0 87 17:45 18:00 43 0 0 43 0 0 43 0 0 0 0 0 0 0 2 0 0 44 44 0 0 0 0 0 0 2 87	15:30 15:45	55	0	0	55	0	0	0	0	3	0	0	42	42	0	0	0	0	3	97
16:15       16:30       59       0       0       59       0        0       0       0       0       0       0       0       0       0       0       0       0       0       0       0        0       <	15:45 16:00	64	0	0	64	0	0	0	0	1	0	0	29	29	0	0	0	0	1	93
16:30         16:45         64         0         0         64         0         0         0         0         3         0         0         31         31         0         0         0         0         0         3         95           16:45         17:00         68         0         0         68         0         0         68         0         0         0         0         1         0         0         41         41         0         0         0         0         1         109           17:00         17:15         70         0         0         70         0         0         0         0         0         37         37         0         0         0         0         107           17:15         17:30         57         0         0         58         0         0         0         0         1         0         0         44         44         0         0         0         0         1         102           17:45         52         0         0         52         0         0         0         0         0         0         44         44         0         0<	16:00 16:15	87	0	0	87	0	0	0	0	2	0	0	35	35	0	0	0	0	2	122
16:45     17:00     68     0     0     68     0     0     0     0     0     1     0     0     41     41     0     0     0     0     1     109       17:00     17:15     70     0     0     70     0     0     0     0     0     0     37     37     0     0     0     0     107       17:15     17:30     57     0     0     58     0     0     0     0     1     0     0     44     44     0     0     0     0     1     102       17:30     17:45     52     0     0     52     0     0     0     0     0     0     35     35     0     0     0     0     87       17:45     18:00     43     0     0     40     0     0     0     44     44     0     0     0     0     87	16:15 16:30	59	0	0	59	0	0	0	0	0	0	0	38	39	0	0	0	0	0	98
17:00     17:15     70     0     0     70     0     0     0     0     0     0     37     37     0     0     0     0     0     107       17:15     17:30     57     0     0     58     0     0     0     0     1     0     0     44     44     0     0     0     0     1     102       17:30     17:45     52     0     0     52     0     0     0     0     0     0     35     35     0     0     0     0     87       17:45     18:00     43     0     0     43     0     0     0     0     2     0     0     44     44     0     0     0     0     87	16:30 16:45	64	0	0	64	0	0	0	0	3	0	0	31	31	0	0	0	0	3	95
17:15     17:30     57     0     0     58     0     0     0     0     1     0     0     44     44     0     0     0     0     1     102       17:30     17:45     52     0     0     52     0     0     0     0     0     0     35     35     0     0     0     0     87       17:45     18:00     43     0     0     43     0     0     0     0     2     0     0     44     44     0     0     0     0     2     87	16:45 17:00	68	0	0	68	0	0	0	0	1	0	0	41	41	0	0	0	0	1	109
17:30 17:45 52 0 0 52 0 0 0 52 0 0 0 0 0 0 0 0 0 0	17:00 17:15	70	0	0	70	0	0	0	0	0	0	0	37	37	0	0	0	0	0	107
17:45 18:00 43 0 0 43 0 0 0 2 0 0 2 0 0 44 44 0 0 0 0 0 2 87	17:15 17:30	57	0	0	58	0	0	0	0	1	0	0	44	44	0	0	0	0	1	102
	17:30 17:45	52	0	0	52	0	0	0	0	0	0	0	35	35	0	0	0	0	0	87
Total: 1274 0 0 1275 0 0 0 31 0 0 1276 0 0 0 0 3.1 0 0 1270 1270 0 0 0 31 2,550	17:45 18:00	43	0	0	43	0	0	0	0	2	0	0	44	44	0	0	0	0	2	87
	Total:	1274	0	0	1275	0	0	0	0	31	0	0	1270	1275	0	0	0	0	31	2,550

Note: U-Turns are included in Totals.

March 26, 2020 Page 3 of 8 March 26, 2020 Page 4 of 8



#### **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

DILL LEATUEM DD

#### **Full Study Cyclist Volume**

	В	ILL LEATHEM I	DR		LONGFIELDS I	DR	
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	3	0	3	3
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	2	0	2	2
07:45 08:00	1	0	1	0	0	0	1
08:00 08:15	0	0	0	2	0	2	2
08:15 08:30	0	0	0	1	0	1	1
08:30 08:45	0	0	0	2	0	2	2
08:45 09:00	1	0	1	3	0	3	4
09:00 09:15	0	0	0	2	0	2	2
9:15 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 BILL LEATHEM DR LONGFIELDS DR

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

March 26, 2020 Page 5 of 8 March 26, 2020 Page 6 of 8



#### **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

	N	orthbo	und		Sc	uthbou	nd		Eastbound S STR E				We	estbour	nd				
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
07:15 07:30	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	4	4
07:30 07:45	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
07:45 08:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
08:00 08:15	4	0	0	4	0	0	0	0	4	0	0	2	2	0	0	0	0	2	6
08:15 08:30	1	0	0	1	0	0	0	0	1	0	0	2	2	0	0	0	0	2	3
08:30 08:45	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	2
08:45 09:00	2	0	0	2	0	0	0	0	2	0	0	2	2	0	0	0	0	2	4
09:00 09:15	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
09:15 09:30	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
09:30 09:45	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
09:45 10:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
11:30 11:45	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
11:45 12:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:00 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:30 12:45	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
12:45 13:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
13:00 13:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
13:15 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00 15:15	2	0	0	2	0	0	0	0	2	0	0	4	4	0	0	0	0	4	6
15:15 15:30	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
15:30 15:45	3	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
15:45 16:00	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
16:00 16:15	2	0	0	2	0	0	0	0	2	0	0	1	1	0	0	0	0	1	3
16:15 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 16:45	3	0	0	3	0	0	0	0	3	0	0	1	1	0	0	0	0	1	4
16:45 17:00	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
17:00 17:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
17:15 17:30	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	1	2
17:30 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 18:00	2	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Total: None	31	0	0	31	0	0	0	0	31	0	0	30	30	0	0	0	0	30	61



#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results**

#### BILL LEATHEM DR @ LONGFIELDS DR

Survey Date: Wednesday, June 10, 2015 WO No: 35082 Start Time: 07:00 Device: Miovision

#### **Full Study 15 Minute U-Turn Total** BILL LEATHEM DR LONGFIELDS DR

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

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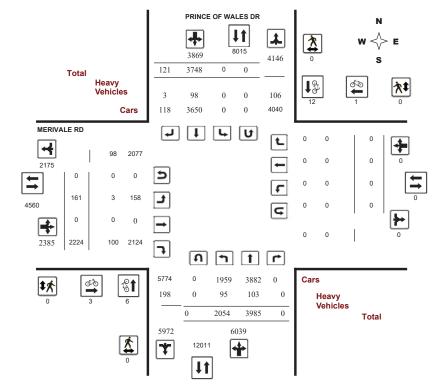
#### **Turning Movement Count - Study Results**

#### 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**

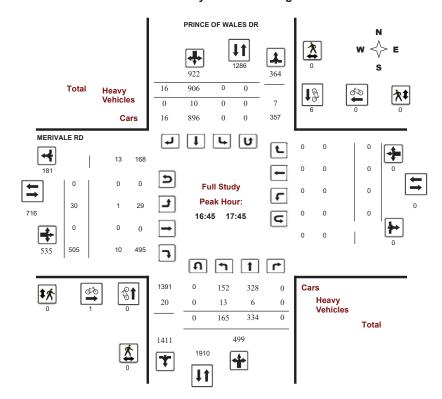
#### **Turning Movement Count - Study Results**

#### 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**



January 16, 2023 Page 1 of 8 January 16, 2023 Page 2 of 8

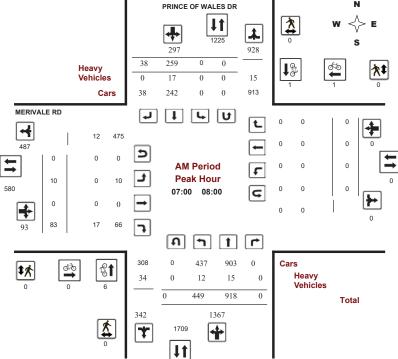


## **Turning Movement Count - Peak Hour Diagram**

#### PRINCE OF WALES DR @ MERIVALE RD

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

 Start Time:
 07:00
 Device:
 Miovision



Comments



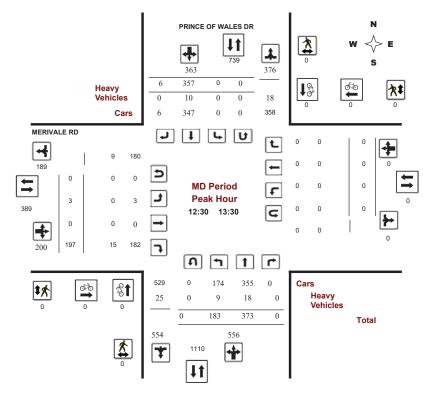
#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Peak Hour Diagram**

PRINCE OF WALES DR @ MERIVALE RD

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

 Start Time:
 07:00
 Device:
 Miovision



Comments

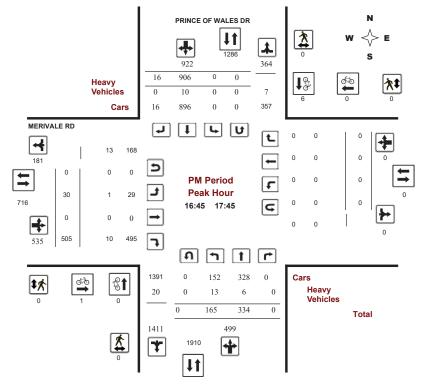


#### **Turning Movement Count - Peak Hour Diagram**

#### PRINCE OF WALES DR @ MERIVALE RD

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

 Start Time:
 07:00
 Device:
 Miovision



Comments



#### **Transportation Services - Traffic Services**

# **Turning Movement Count - Study Results**

#### PRINCE OF WALES DR @ MERIVALE RD

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

 Start Time:
 07:00
 Device:
 Miovision

#### Full Study Summary (8 HR Standard)

Survey Date: Wednesday, June 13, 2018 Total Observed U-Turns

Northbound: 0 Southbound: 0 .90

Eastbound:	0	Westbound:	0	
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								Eastbou	nd: ()		Wes	tbound	0						
		PR	INCE	OF WA	ALES	DR			_			ME	RIVAL	E RD					
	No	rthbou	nd		So	uthbou	ınd			Ea	astbou	und		W	estbou	und			
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Gran Tota
07:00 08:00	449	918	0	1367	0	259	38	297	1664	10	0	83	93	0	0	0	0	93	175
08:00 09:00	418	718	0	1136	0	229	16	245	1381	10	0	93	103	0	0	0	0	103	1484
09:00 10:00	295	651	0	946	0	256	11	267	1213	8	0	130	138	0	0	0	0	138	135
11:30 12:30	202	344	0	546	0	341	8	349	895	11	0	202	213	0	0	0	0	213	1108
12:30 13:30	183	373	0	556	0	357	6	363	919	3	0	197	200	0	0	0	0	200	1119
15:00 16:00	164	337	0	501	0	704	6	710	1211	58	0	446	504	0	0	0	0	504	1715
16:00 17:00	183	312	0	495	0	759	22	781	1276	38	0	577	615	0	0	0	0	615	1891
17:00 18:00	160	332	0	492	0	843	14	857	1349	23	0	496	519	0	0	0	0	519	1868
Sub Total	2054	3985	0	6039	0	3748	121	3869	9908	161	0	2224	2385	0	0	0	0	2385	12293
U Turns				0				0	0				0				0	0	0
Total	2054	3985	0	6039	0	3748	121	3869	9908	161	0	2224	2385	0	0	0	0	2385	12293
EQ 12Hr	2855	5539	0	8394	0	5210	168	5378	13772	224	0	3091	3315	0	0	0	0	3315	17087
Note: These	values a	are calcu	lated by	y multiply	ing the	totals b	y the a	ppropriat	e expans	ion facto	or.			1.39					
AVG 12Hr	2570	4985	0	7555	0	6142	198	4840	12395	202	0	2782	2984	0	0	0	0	2984	15378
Note: These	volumes	are calc	culated	by multip	plying th	ne Equiv	alent 1	2 hr. tota	als by the	AADT f	actor.			.90					
AVG 24Hr	3367	6530	0	9897	0	8046	259	6340	16237	265	0	3644	3909	0	0	0	0	3909	20145
Note: These	volumes	s are calc	culated	by multir	olvina ti	ne Avera	age Dai	ilv 12 hr.	totals by	12 to 24	expan	sion fac	ctor.	1.31					
///000					,9		-g - Du	.,			pu								

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

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PRINCE OF WALES DR

#### **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**

MERIVALE RD

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

Note: U-Turns are included in Totals.



#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results**

PRINCE OF WALES DR @ MERIVALE RD

PRINCE OF WALES DR

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

 Start Time:
 07:00
 Device:
 Miovision

#### **Full Study Cyclist Volume**

MERIVALE RD

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

January 16, 2023 Page 4 of 8 January 16, 2023 Page 5 of 8



#### **Turning Movement Count - Study Results**

#### PRINCE OF WALES DR @ MERIVALE RD

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

 Start Time:
 07:00
 Device:
 Miovision

#### Full Study Pedestrian Volume

PRINCE OF WALES DR MERIVALE RD

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
7:15 07:30	0	0	0	0	0	0	0
7:30 07:45	0	0	0	0	0	0	0
7:45 08:00	0	0	0	0	0	0	0
8:00 08:15	0	0	0	0	0	0	0
8:15 08:30	0	0	0	0	0	0	0
8:30 08:45	0	0	0	0	0	0	0
8:45 09:00	0	0	0	0	0	0	0
9:00 09:15	0	0	0	0	0	0	0
9:15 09:30	0	0	0	0	0	0	0
9:30 09:45	0	0	0	0	0	0	0
9:45 10:00	0	0	0	0	0	0	0
1:30 11:45	0	0	0	0	0	0	0
1:45 12:00	0	0	0	0	0	0	0
2:00 12:15	0	0	0	0	0	0	0
2:15 12:30	0	0	0	0	0	0	0
2:30 12:45	0	0	0	0	0	0	0
2:45 13:00	0	0	0	0	0	0	0
3:00 13:15	0	0	0	0	0	0	0
3:15 13:30	0	0	0	0	0	0	0
5:00 15:15	0	0	0	0	0	0	0
5:15 15:30	0	0	0	0	0	0	0
5:30 15:45	0	0	0	0	0	0	0
5:45 16:00	0	0	0	0	0	0	0
6:00 16:15	0	0	0	0	0	0	0
6:15 16:30	0	0	0	0	0	0	0
6:30 16:45	0	0	0	0	0	0	0
6:45 17:00	0	0	0	0	0	0	0
7:00 17:15	0	0	0	0	0	0	0
7:15 17:30	0	0	0	0	0	0	0
7:30 17:45	0	0	0	0	0	0	0
7:45 18:00	0	0	0	0	0	0	0
otal	0	0	0	0	0	0	0



#### **Transportation Services - Traffic Services**

#### **Turning Movement Count - Study Results**

#### PRINCE OF WALES DR @ MERIVALE RD

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

 Start Time:
 07:00
 Device:
 Miovision

#### **Full Study Heavy Vehicles**

PRINCE OF WALES DR MERIVALE RD

	N	orthbo	und		Sc	outhbou	ınd			Е	astbour	nd		W	estbour	nd			
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR	Grand Total
07:00 07:1		4	0	17	0	5	0	9	26	0	0	6	8	0	0	0	0	8	17
07:15 07:3	7	4	0	19	0	5	0	9	28	0	0	3	10	0	0	0	0	10	19
07:30 07:4	5 2	4	0	15	0	4	0	8	23	0	0	5	7	0	0	0	0	7	15
07:45 08:0	) 1	3	0	10	0	3	0	6	16	0	0	3	4	0	0	0	0	4	10
08:00 08:1	3	3	0	13	0	5	0	8	21	0	0	2	5	0	0	0	0	5	13
08:15 08:3	) 5	3	0	16	0	4	0	7	23	0	0	4	9	0	0	0	0	9	16
08:30 08:4	5 1	0	0	8	0	2	0	2	10	0	0	5	6	0	0	0	0	6	8
08:45 09:0	) 4	0	0	11	0	6	0	6	17	0	0	1	5	0	0	0	0	5	11
09:00 09:1	3	3	0	10	0	2	0	5	15	0	0	2	5	0	0	0	0	5	10
09:15 09:3	) 2	6	0	18	0	6	0	12	30	0	0	4	6	0	0	0	0	6	18
09:30 09:4	5 0	5	0	10	0	2	0	7	17	0	0	3	3	0	0	0	0	3	10
09:45 10:00	) 1	2	0	7	0	3	0	7	14	2	0	1	4	0	0	0	0	4	9
11:30 11:4	5 1	4	0	9	0	2	0	6	15	0	0	2	3	0	0	0	0	3	9
11:45 12:00	) 4	4	0	17	0	3	0	7	24	0	0	6	10	0	0	0	0	10	17
12:00 12:1	5 2	3	0	12	0	4	1	8	20	0	0	3	6	0	0	0	0	6	13
12:15 12:30	3	2	0	12	0	3	0	5	17	0	0	4	7	0	0	0	0	7	12
12:30 12:4	5 2	2	0	13	0	3	0	5	18	0	0	6	8	0	0	0	0	8	13
12:45 13:0	2	3	0	9	0	1	0	4	13	0	0	3	5	0	0	0	0	5	9
13:00 13:1	5 1	7	0	11	0	2	0	9	20	0	0	1	2	0	0	0	0	2	11
13:15 13:30	) 4	6	0	19	0	4	0	10	29	0	0	5	9	0	0	0	0	9	19
15:00 15:1	5 2	2	0	12	0	5	1	8	20	0	0	3	6	0	0	0	0	6	13
15:15 15:30	) 5	3	0	13	0	3	1	7	20	0	0	2	8	0	0	0	0	8	14
15:30 15:4	5 2	4	0	12	0	4	0	8	20	0	0	2	4	0	0	0	0	4	12
15:45 16:0	3	5	0	13	0	2	0	7	20	0	0	3	6	0	0	0	0	6	13
16:00 16:1	10	5	0	20	0	2	0	7	27	0	0	3	13	0	0	0	0	13	20
16:15 16:3	) 4	3	0	13	0	2	0	5	18	0	0	4	8	0	0	0	0	8	13
16:30 16:4	5	5	0	13	0	1	0	6	19	0	0	2	7	0	0	0	0	7	13
16:45 17:0	) 6	2	0	17	0	5	0	8	25	1	0	4	11	0	0	0	0	11	18
17:00 17:1	5 4	1	0	10	0	2	0	3	13	0	0	3	7	0	0	0	0	7	10
17:15 17:30	) 1	1	0	4	0	0	0	1	5	0	0	2	3	0	0	0	0	3	4
17:30 17:4	5 2	2	0	8	0	3	0	5	13	0	0	1	3	0	0	0	0	3	8
17:45 18:0	) 1	2	0	5	0	0	0	2	7	0	0	2	3	0	0	0	0	3	5
Total: None	95	103	0	396	0	98	3	207	603	3	0	100	201	0	0	0	0	201	402

January 16, 2023 Page 6 of 8 January 16, 2023 Page 7 of 8



#### **Turning Movement Count - Study Results**

#### PRINCE OF WALES DR @ MERIVALE RD

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

 Start Time:
 07:00
 Device:

#### Full Study 15 Minute U-Turn Total

37904

Miovision

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
To	otal	0	0	0	0	0

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# Appendix C

Synchro and Sidra Intersection Worksheets – Existing Conditions



Lanes, Volumes, Timings 1: Merivale & Leikin

ExistingAM Peak Hour 50 Leikin Dr

	•	$\rightarrow$	†	ļ	4	
Lane Group	EBL	EBR	NBT	SBT	SBR	Ø3
Lane Configurations	*	7	<b></b>	<b>†</b>	7	
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	
			0.5	0.5	0.5	Lead
Lead/Lag	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes 3.0	2.0	2.0	3.0	Yes 3.0
Vehicle Extension (s)	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	Е	В	В	Α	Α	
Approach Delay	56.3		10.7	3.3		
Approach LOS	E		В	Α		
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)	001.2	240.0	020.0	101.0	115.0	
Base Capacity (vph)	432	389	1080	890	1012	
Starvation Cap Reductn	0	0	0	0.00	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductin	0	0	0	0	0	
Reduced v/c Ratio	0.78	0.01	0.36	0.08	0.25	
reduced N/C Kallo	0.78	0.01	0.30	0.08	0.20	

#### Intersection Summary

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

05-15-2023 JK **CGH Transportation** Page 1 Lanes, Volumes, Timings 1: Merivale & Leikin

ExistingAM Peak Hour 50 Leikin Dr

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 23.2 Intersection LOS: C Intersection Capacity Utilization 47.1% ICU
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles. ICU Level of Service A

Splits and Phases: 1: Merivale & Leikin ∜Îø2 ₹ ø4 ø3 **∜** Ø6

05-15-2023 CGH Transportation JK Page 2

HCM 95th %tile Q(veh)

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	7	T T	NOL.	<u>ND1</u>	1	ODIN
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	-
Grade, %	0			0	0	
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	4	7	100
Mymt Flow	7	16	110	488	182	1
Major/Minor	Minor2		Majart		MaiorO	
			Major1		Major2	
Conflicting Flow All	891	183	183	0	-	0
Stage 1	183	-	-	-	-	-
Stage 2	708	-	- 4.40	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy		3.318		-	-	-
Pot Cap-1 Maneuver	313	859	1392	-	-	-
Stage 1	848	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Platoon blocked, %	00-	0.00	100-	-	-	-
Mov Cap-1 Maneuver		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	В					
		NDI	NDT	EDI 4	EDI 0	ODT
Minor Lane/Major Mvm	nt	NBL		EBLn1		SBT
Capacity (veh/h)		1392	-	288	859	-
HCM Lane V/C Ratio		0.079		0.023		-
HCM Control Delay (s)	)	7.8	-	17.8	9.3	-
HCM Lane LOS		Α	-	С	Α	-

Intersection													
nt Delay, s/veh	50.5												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
ane Configurations	ሻ			*	1,			4			4		
Fraffic Vol, veh/h	151	558	4	7	20	37	1	2	4	213	3	32	
uture Vol. veh/h	151	558	4	7	20	37	1	2	4	213	3	32	
conflicting Peds, #/hr		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	-	1100	None	1100	1100	None	Otop	Otop	None	Olop	Otop	None	
Storage Length	30		NONE			INUITE -		- 1	INUITE -			INUITE	
/eh in Median Storag		0		_	0			0			0		
Grade. %	C, # - -	-			0			0			0		
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90	
Heavy Vehicles, %	30	2	2	29	35	2	2	2	25	2	33	2	
	168	620	4	8	22	41	1	2	4	237	3	36	
Mvmt Flow	108	620	4	ŏ	22	41	- 1	2	4	231	3	30	
Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	63	0	0	629	0	0	1041	1042	627	1020	1024	43	
Stage 1	-	-	-	-	-	-	963	963	-	59	59	-	
Stage 2	-	-	-	-	-	-	78	79	-	961	965	-	
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-	
Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318	
Pot Cap-1 Maneuver	1533	-	-	836	-	-	208	230	444	~ 215	208	1027	
Stage 1	-	-	-	-	-	-	307	334	-	953	789	-	
Stage 2	-	-	-	-	-	-	931	829	-	308	296	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1533	-	-	833	-	-	180	202	442	~ 192	183	1027	
Mov Cap-2 Maneuver		-	-	-	-	-	180	202		~ 192	183	-	
Stage 1	-	-	-	-	-	-	272	296	-	848	781	-	
Stage 2	-	-	-	-			886	821	-	269	262	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s				1			17.9			204.6			
HCM LOS	1.0			- 1			17.9 C			204.0 F			
HOW LOS							C			Г			
Minor Lane/Major Mvi	mt	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	s)	17.9	7.6	-	-	9.4	-	-	204.6				
HCM Lane LOS		С	Α	-	-	Α	-	-	F				
HCM 95th %tile Q(vel	h)	0.1	0.4	-	-	0	-	-	14.7				
Notes													
: Volume exceeds ca	anacity	\$- D/	alay ava	eeds 30	)ne	r. Com	nutation	Not De	ofined	*· ΔII	maior v	olume i	n platooi
. Volume exceeds Ca	apacity	φ. Dt	eldy exc	ecus si	105 .	r. Colli	JulatiOf	NOL DE	mileu	. All	major v	olullie II	ii piatoofi

0.3 - 0.1 0.1 - -

Lanes, Volumes, Timings 5: Prince of Wales & Merivale ExistingAM Peak Hour 50 Leikin Dr

	•	7	1	†	<del> </del>	
Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations	*	7	*	<b>†</b>	<b>†</b> 13	
Traffic Volume (vph)	10	83	449	918	259	
Future Volume (vph)	10	83	449	918	259	
Lane Group Flow (vph)	11	92	499	1020	330	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.7	90.2	95.3	74.4	
Actuated g/C Ratio	0.10	0.13	0.90	0.95	0.74	
v/c Ratio	0.07	0.38	0.58	0.61	0.14	
Control Delay	41.9	10.6	4.3	4.2	5.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.9	10.6	4.3	4.2	5.8	
LOS	D	В	Α	Α	Α	
Approach Delay	13.9			4.2	5.8	
Approach LOS	В			Α	Α	
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

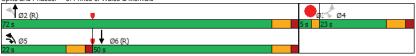
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 15 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Natural Cycle: 90

05-15-2023 JK **CGH Transportation** Page 7 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 Capacity Utilization 70.4%
Analysis Period (min) 15 Intersection LOS: A ICU Level of Service C

Splits and Phases: 5: Prince of Wales & Merivale



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Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	ሻ	7	1		ሻ	<u>→</u>
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	Stop -		-	None	-	None
Storage Length	0	8		NOHE -	30	NOTICE -
	-	-			-	0
Veh in Median Storage			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	1	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			_	2.218	
Pot Cap-1 Maneuver	460	691			1195	
Stage 1	711	031			1133	- 1
	788					
Stage 2	788	-	-	-	-	-
Platoon blocked, %	400	004	-	-	4405	-
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					
		NDT	NDD	MDL 4	MDI O	ODI
Minor Lane/Major Mvm	nt	NBT	NRKA	VBLn1V		SBL
Capacity (veh/h)		-	-	460	691	1195
HCM Lane V/C Ratio		-	-		0.002	
HCM Control Delay (s)		-	-	15.3	10.2	8
HCM Lane LOS		-	-	С	В	Α
HCM 95th %tile Q(veh	)	-	-	0.9	0	0

	•	4	†	_	1	Ţ
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	<b></b>	7	ች	<b>^</b>
Traffic Volume (vph)	16	17	304	548	253	51
Future Volume (vph)	16	17	304	548	253	51
Lane Group Flow (vph)	18	19	338	609	281	57
Turn Type	Perm	Perm	NA	Perm	pm+pt	NA
Protected Phases			2		1	6
Permitted Phases	8	8	=	2	6	-
Detector Phase	8	8	2	2	1	6
Switch Phase			_	_	•	
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	24.7	24.7	31.4	31.4	11.4	16.4
Total Split (s)	26.7	26.7	36.4	36.4	36.4	36.4
Total Split (%)	26.8%	26.8%	36.6%	36.6%	36.6%	36.6%
Maximum Green (s)	20.0 %	20.0%	30.0 %	30.0 %	30.0 %	30.0 %
Yellow Time (s)	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.4	3.4	2.7	2.7	2.7	2.7
(-)	-					
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.4	6.4	6.4	6.4
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?	0.0	0.0	Yes	Yes	Yes	0.0
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	С	В	В	Α	Α	Α
Approach Delay	20.1		9.0			6.1
Approach LOS	С		Α			Α
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	0.2	75.1	22.0	20.0	162.3
Turn Bay Length (m)	7 0.0			130.0	150.0	102.0
Base Capacity (vph)	540	444	837	1013	1003	1433
Starvation Cap Reductn	0	0	0.57	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
			0.40			
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 Signal Delay: 8.5
Intersection Capacity Utilization 63.3%
ICU Level of Service B
Analysis Period (min) 15

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 CGH Transportation

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Lanes, Volumes, Timings 1: Merivale & Leikin ExistingAM Peak Hour 50 Leikin Dr

	•	•		<b>†</b>	ļ	4		
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3	ı
Lane Configurations	*	7	ች	<b>†</b>	<b>†</b>	7		Ī
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	С	В	Α	Α	В	Α		
Approach Delay	33.9			9.2	8.8			
Approach LOS	С			Α	Α			
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

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Lanes, Volumes, Timings 1: Merivale & Leikin ExistingAM Peak Hour 50 Leikin Dr HCM 2010 TWSC 3: Merivale & Beckstead ExistingAM Peak Hour 50 Leikin Dr

# Maximum v/c Ratio: 0.67 Intersection Signal Delay: 14.2 Intersection Capacity Utilization 46.9% ICU Level of Service A Analysis Period (min) 15 Splits and Phases: 1: Merivale & Leikin

latana ati an						
Intersection	0.0					
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	ሻ	7	Ť	<b>†</b>	1>	
Traffic Vol, veh/h	7	112	43	244	459	0
Future Vol, veh/h	7	112	43	244	459	0
Conflicting Peds, #/hr	r 0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-		-	None	-	None
Storage Length	0	8	40	-		-
Veh in Median Storag	ne. # 0	-	-	0	0	-
Grade. %	0	-	-	0	0	
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	5	2	2
Mymt Flow	8	124	48	271	510	0
WWITETIOW	U	124	70	211	010	U
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	r 305	563	1055	-	-	-
Mov Cap-2 Maneuver		-	-	-		-
Stage 1	576	-	-	-	-	-
Stage 2	701			-		
Olugo 2	701					
Approach	EB		NB		SB	
HCM Control Delay, s			1.3		0	
HCM LOS	В					
Minor Lane/Major Mv	mt	NBL	NRT	EBLn1	FRI n2	SBT
Capacity (veh/h)	1110	1055	- 1401	305	563	-
HCM Lane V/C Ratio		0.045		0.026		
HCM Control Delay (s		8.6	-	17.1	13.2	-
HCM Lane LOS	3)	ο.ο		17.1	13.2 B	
LICINI FALIG FOS		А	-	U	В	-

0.1 - 0.1 0.8 - -

HCM 95th %tile Q(veh)

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	1>			ĵ.			4			4	
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 N	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 Mvm	t I	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)		283	969	-	-	1515		-	489			
HCM Lane V/C Ratio		0.004	0.075	- :	- 1	1010						
HCM Control Delay (s)		17.8	9			0			18.6			
HCM Lane LOS		C.C	A			A			C			
HOM CELL COLUMN		0	^^						2.4			

	•	*	1	†	<b>+</b>	
Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations	*	7	*	<b></b>	<b>↑</b> 1>	
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	0.0
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead	0.0	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	HOHE	HOHE	O-IVIDA	7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0.0
Act Effct Green (s)	10.1	34.8	103.4	105.9	68.5	U
Actuated g/C Ratio	0.08	0.29	0.86	0.88	0.57	
v/c Ratio	0.08	1.05	0.32	0.00	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	55.9 E	04.0 F	3.6 A	2.0 A	17.3 B	
Approach Delay	83.0	Г	А	2.9	17.3	
	03.U			2.9 A	17.3 B	
Approach LOS		400.7	7.5	17.2		
Queue Length 50th (m)	7.4 17.6	~126.7	7.5 12.6	26.0	75.0 92.9	
Queue Length 95th (m)		#194.5	12.0			
Internal Link Dist (m)	354.7		400.0	333.0	741.3	
Turn Bay Length (m)	135.0	500	120.0	4540	4000	
Base Capacity (vph)	262	532	566	1540	1886	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.13	1.05	0.32	0.24	0.54	

Intersection Summary

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

0 0.2 - - 0 - - 2.4

HCM 95th %tile Q(veh)

#### 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 LOS: C
ICU Level of Service C Intersection Signal Delay: 31.6 Intersection Capacity Utilization 70.7% 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 ExistingAM Peak Hour 50 Leikin Dr 8: Leikin & Beckstead

Internation							
Intersection Int Delay, s/veh	1						
init Delay, S/Ven	1						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	ሻ	7	Þ		7	•	
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 Storag		-	0	-	-	0	
Grade, %	0	-	0	-	-	0	
Peak Hour Factor	90	90	90	90	90	90	
Heavy Vehicles, %	2	2	3	2	2	3	
Mvmt Flow	48	1	248	132	1	237	
Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	553	314	0	0	380	0	
Stage 1	314	314	-	-	300	-	
Stage 2	239						
Critical Hdwy	6.42	6.22			4.12		
Critical Hdwy Stg 1	5.42	0.22			4.12		
Critical Hdwy Stg 2	5.42	-	_		_		
Follow-up Hdwy	3.518	3.318					
Pot Cap-1 Maneuver	494	726			1178		
Stage 1	741	120			- 1170		
Stage 2	801		_		_		
Platoon blocked. %	001		-				
Mov Cap-1 Maneuver	494	726	-		1178		
Mov Cap-2 Maneuver	494	- 120			-		
Stage 1	741	-	-		-		
Stage 2	800						
5.00g0 L	550						
Approach	WB		NB		SB		
HCM Control Delay, s			0		0		
HCM LOS	В						
Minor Lane/Major Mvr	nt	NBT	NBR	NBLn1\	NBLn2	SBL	SBT
Capacity (veh/h)		-	-	494	726	1178	-
HCM Lane V/C Ratio					0.002		
HCM Control Delay (s	()	-	_	13.1	10	8.1	
HCM Lane LOS	,			В	В	A	
LIOM OF HE OVER TO COLUMN	,			0.0	٥		

- - 0.3 0

HCM 95th %tile Q(veh)

Lanes, Volumes, Timings 13: Leikin

ExistingAM Peak Hour 50 Leikin Dr

	✓	*	1	-	-	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	<u> </u>	7	7	<u> </u>
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	Е	Α	В	Α	В	В
Approach Delay	37.7		13.5			12.5
Approach LOS	D		В			В
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

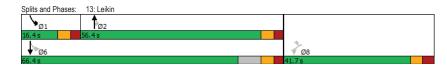
Cycle Length: 114.5
Actuated Cycle Length: 106.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

05-15-2023 JK CGH Transportation Page 11 Lanes, Volumes, Timings 13: Leikin

ExistingAM Peak Hour 50 Leikin Dr

Maximum v/c Ratio: 0.90 Intersection Signal Delay: 29.9 Intersection LOS: C Intersection Capacity Utilization 55.7% ICU
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles. ICU Level of Service B



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# Appendix D

Bill Leathem Drive at Leikin Drive Signalization Warrants



#### Bill Leathem Dr @ Leikin Dr Existing

#### Justification #7

		Minimum R	equirement	Minimum R	equirement		Compliance			
Justification	Description	1 Lane	Highway	2 or Mo	re Lanes	Secti	ional	Entire %	Signal	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	EIItile 76		
1. Minimum Vehicular	A. Vehicle volume, all approaches (average hour)	480	720	600	900	477	66%	66%	No	
Volume	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	115	68%	00%	INO	
	A. Vehicle volumes, major street (average hour)	480	720	600	900	362	50%			
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	65	87%	50%	No	

### Bill Leathem Dr @ Leikin Dr FB2026

### Justification #7

		Minimum R	lequirement	Minimum R	equirement		Compliance			
Justification	Description	1 Lane	Highway	2 or More Lanes		Sectional		Entire %	Signal	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	EIILII 20		
1. Minimum Vehicular	A. Vehicle volume, all approaches (average hour)	480	720	600	900	489	68%	68%	No	
Volume	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	127	75%	00%	INO	
	A. Vehicle volumes, major street (average hour)	480	720	600	900	362	50%			
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	65	87%	50%	No	

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. - Intersection factor corrected, applies only to 18

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 18

#### Bill Leathem Dr @ Leikin Dr FB2031

#### Justification #7

		Minimum R	lequirement	Minimum R	equirement		Compliance			
Justification	Description	1 Lane	Highway	2 or Mo	re Lanes	Sect	ional	Entire %	Signal	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	Elitile 70		
1. Minimum Vehicular	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%	68%	INO	
	A. Vehicle volumes, major street (average hour)	480	720	600	900	362	50%			
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	65	87%	50%	No	

Bill Leathem Dr @ Leikin Dr FT2026

### Justification #7

		Minimum R	lequirement	Minimum R	equirement		Compliance			
Justification	Description	1 Lane	Highway	2 or More Lanes		Sectional		Entire %	Signal	
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	EIItile 76		
1. Minimum Vehicular	A. Vehicle volume, all approaches (average hour)	480	720	600	900	511	71%	71%	No	
Volume	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	135	80%	/170	INO	
	A. Vehicle volumes, major street (average hour)	480	720	600	900	375	52%			
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	67	90%	52%	No	

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. - Intersection factor corrected, applies only to 18

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 18

#### Bill Leathem Dr @ Leikin Dr FT2031

#### Justification #7

		Minimum R	equirement	Minimum R	equirement		Compliance		
Justification	Description	1 Lane I	Highway	2 or Mo	re Lanes	Sect	ional	Entire %	Signal
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	Elitile 70	
1. Minimum Vehicular	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%	/ 1/0	140
	A. Vehicle volumes, major street (average hour)	480	720	600	900	375	52%		
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	67	90%	52%	No

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. - Intersection factor corrected, applies only to 18

#### 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:

- The total vehicle volume on all intersection approaches exceeds 375 vehicles per hour for each of the highest eight hours of the day; and,
- The combined vehicle and pedestrian volume on the minor street exceeds 150 units per hour (all vehicles plus pedestrians wishing to enter the intersection) for each of the same eight hours as the total volume; OR the combined vehicle and pedestrian volume on the minor street exceeds 120 units per our (all vehicles plus pedestrians wishing to enter the intersection) for each of the same eight hours as the total volume, with an average delay to all minor street traffic (vehicles and pedestrians) of greater than 30 seconds for the entire eight hour period; and,
- The volume split does not exceed 70/30 (that is the minor street must not be less than 30% of the total volume entering the intersection) as measured over the entire eight-hour count period. Volume on the major street is defined as vehicles only. Volume on the minor street includes all vehicles plus any pedestrians wishing to cross the major roadway. For three-legged intersections a volume split of 75/25 is permissible.

AWSC Warrants - Bill Leathem Drive at Leikin Drive Existing

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

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

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

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

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

# Appendix E

Collision Data



Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
2017-08-17	2017	13:32	BECKSTEAD RD @ MERIVALE RD (0001556)	01 - Clear	01 - Daylight	02 - Stop sign	00 - Unknown	02 - Non-fatal injury	03 - Rear end	02 - Wet	1	0	0	0
2016-02-14	2016	11:12	BILL LEATHEM DR @ LEIKIN DR S (0005135)	05 - Drifting Snow	01 - Daylight	02 - Stop sign	01 - Functioning	03 - P.D. only	07 - SMV other	06 - Ice	2	0	0	0
2016-03-28	2016	15:59	BILL LEATHEM DR @ LEIKIN DR S (0005135)	01 - Clear	01 - Daylight	02 - Stop sign	01 - Functioning	03 - P.D. only	03 - Rear end	02 - Wet	2	0	0	0
2017-09-29	2017	22:50	BILL LEATHEM DR @ LEIKIN DR S (0005135)	02 - Rain	07 - Dark	02 - Stop sign	01 - Functioning	03 - P.D. only	02 - Angle	02 - Wet	1	0	0	0
2018-12-06	2018	14:10	BILL LEATHEM DR @ LEIKIN DR S (0005135)	01 - Clear	01 - Daylight	02 - Stop sign	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	2	0	0	0
2019-09-23	2019	7:42	BILL LEATHEM DR @ LEIKIN DR S (0005135)	02 - Rain	01 - Daylight	02 - Stop sign	01 - Functioning	03 - P.D. only	99 - Other	02 - Wet	2	0	0	0
2019-10-31	2019	7:25	BILL LEATHEM DR @ LEIKIN DR S (0005135)	02 - Rain	03 - Dawn	02 - Stop sign	01 - Functioning	03 - P.D. only	02 - Angle	02 - Wet	2	0	0	0
2016-08-12	2016	9:23	BILL LEATHEM DR btwn Continuation of BILL LEATHEM DR & LEIKIN DR (3ZA10X)	02 - Rain	01 - Daylight	10 - No control	0	03 - P.D. only	07 - SMV other	02 - Wet	2	0	0	0
2019-02-25	2019	11:18	BILL LEATHEM DR btwn Continuation of BILL LEATHEM DR & PARAGON AVE (3ZA10Z)	05 - Drifting Snow	01 - Daylight	10 - No control	0	03 - P.D. only	07 - SMV other	06 - Ice	2	0	0	0
2016-01-03	2016	9:29	BILL LEATHEM DR btwn PARAGON AVE & Continuation of BILL LEATHEM DR (3ZA10Y)	03 - Snow	01 - Daylight	10 - No control	0	03 - P.D. only	01 - Approaching	03 - Loose snow	2	0	0	0
2017-11-02	2017	9:04	LEIKIN DR @ MERIVALE RD (0005133)	02 - Rain	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	07 - SMV other	02 - Wet	2	0	0	0
2017-10-31	2017	14:34	LEIKIN DR @ MERIVALE RD (0005133)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	02 - Non-fatal injury	02 - Angle	01 - Dry	1	0	0	0
2018-12-19	2018	14:55	LEIKIN DR @ RCMP ACCESS/150 N OF BILL LEATHEM DR (0013517)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2020-01-15	2020	7:57	LEIKIN DR @ RCMP ACCESS/150 N OF BILL LEATHEM DR (0013517)	01 - Clear	01 - Daylight	01 - Traffic signal	01 - Functioning	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2016-08-19	2016	8:45	LEIKIN DR btwn BECKSTEAD RD & BILL LEATHEM DR (3ZA105)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	1	0	0	0
2017-01-05	2017	13:50	LEIKIN DR btwn BECKSTEAD RD & BILL LEATHEM DR (3ZA105)	04 - Freezing Rain	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	06 - Ice	2	0	0	0
2020-06-02	2020	13:41	LEIKIN DR btwn BECKSTEAD RD & BILL LEATHEM DR (3ZA105)	02 - Rain	01 - Daylight	10 - No control	0	03 - P.D. only	99 - Other	02 - Wet	1	0	0	0
2017-12-13	2017	16:35	LEIKIN DR btwn HOLITZNER WAY & CRESTWAY DR (3ZA40I)	03 - Snow	05 - Dusk	10 - No control	0	03 - P.D. only	07 - SMV other	03 - Loose snow	1	0	0	0
2018-01-14	2018	0:43	LEIKIN DR btwn HOLITZNER WAY & CRESTWAY DR ( 37A401)	01 - Clear	07 - Dark	10 - No control	0	D3 - 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**

Turrels True		AM Peak Hou	r		PM Peak Hou	r
Truck Type	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

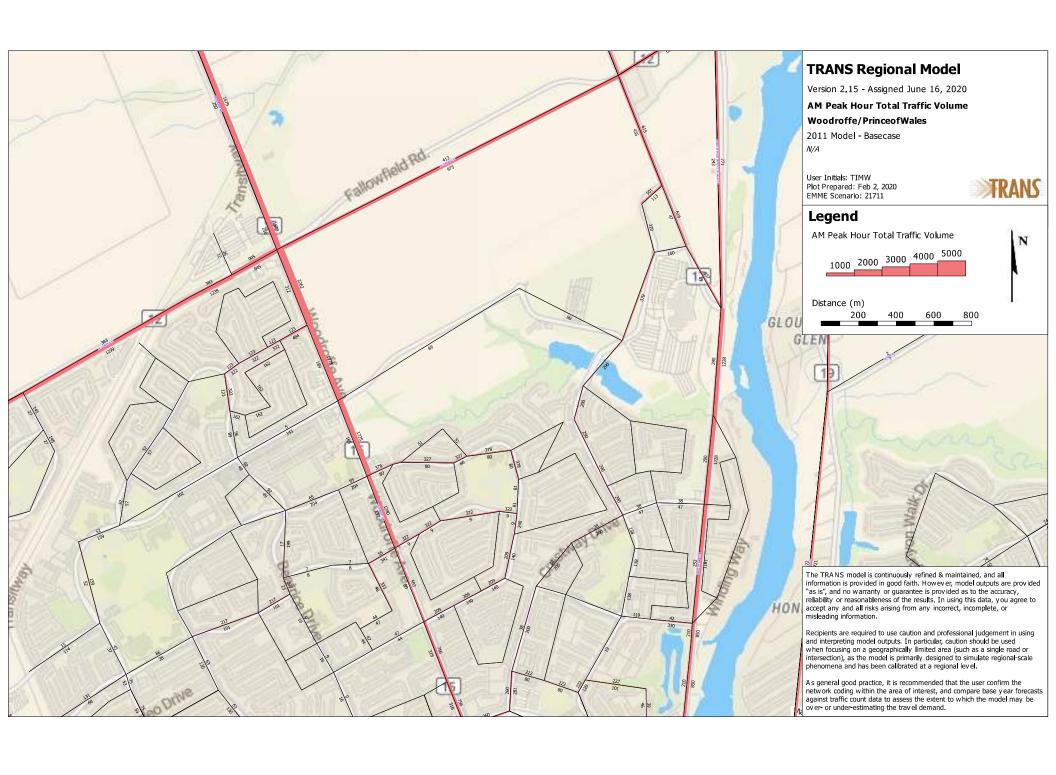
```
Sample: 600 \text{ employees} * 20\% \text{ on } 12:00 \text{AM shift} = 120 \text{ trips} * 80\% \text{ auto mode} * 90\% \text{ arriving} = 86 \text{ inbound autos}
600 \text{ employees} * 40\% \text{ on } 8:00 \text{AM shift} = 240 \text{ trips} * 80\% \text{ auto mode} * 30\% \text{ departing} = 58 \text{ outbound autos}
```

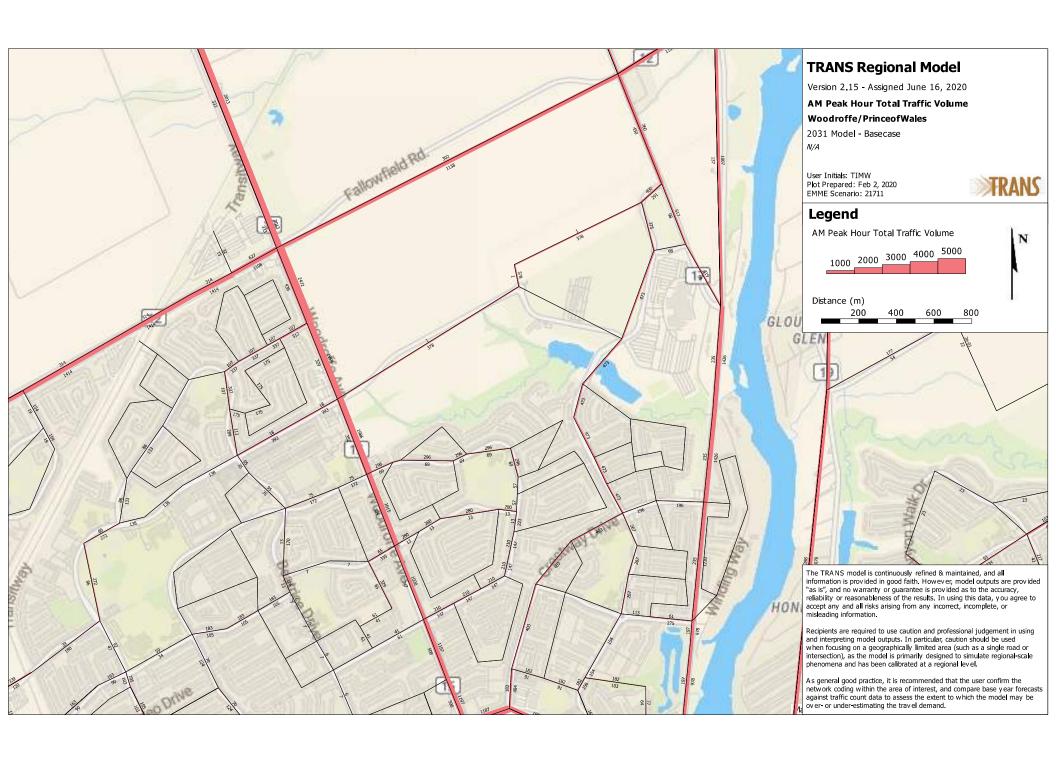
In the PM peak hour, 10% of employees arriving for their shifts and 100% of employees departing from their shifts are assumed to be captured

# Appendix G

**Background Development Volumes** 







# Appendix H

**Growth Data** 



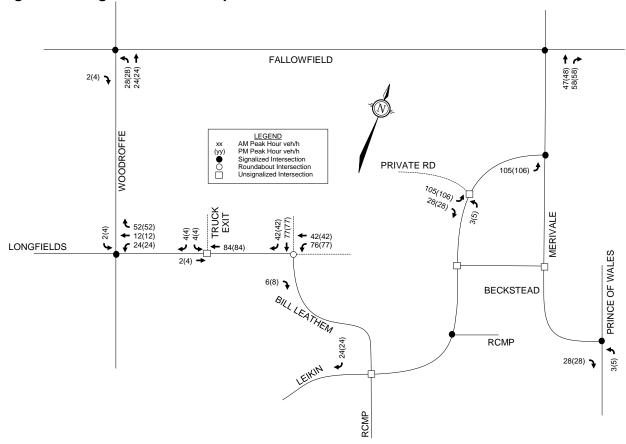
The distribution of heavy vehicle trips generated by the development has been estimated (see below).

- 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,

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# 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

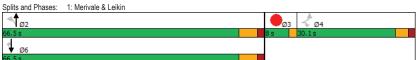
	•	•	1	↓	4	
Lane Group	EBL	EBR	NBT	SBT	SBR	Ø3
Lane Configurations	*	7	<b></b>	<b>*</b>	7	
Traffic Volume (vph)	409	4	354	65	227	
Future Volume (vph)	409	4	354	65	227	
Lane Group Flow (vph)	409	4	354	65	227	
Turn Type	Perm	Perm	NA	NA	Perm	
Protected Phases			2	6		3
Permitted Phases	4	4			6	
Detector Phase	4	4	2	6	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0
Minimum Split (s)	22.1	22.1	16.5	34.5	34.5	8.0
Total Split (s)	30.1	30.1	66.5	66.5	66.5	8.0
Total Split (%)	28.8%	28.8%	63.6%	63.6%	63.6%	8%
Maximum Green (s)	25.0	25.0	60.0	60.0	60.0	6.0
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	2.0
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	
Lead/Lag	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes				Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	None
Walk Time (s)	7.0	7.0		7.0	7.0	3.0
Flash Dont Walk (s)	10.0	10.0		21.0	21.0	0.0
Pedestrian Calls (#/hr)	0	0		0	0	4
Act Effct Green (s)	25.0	25.0	60.1	60.1	60.1	
Actuated g/C Ratio	0.25	0.25	0.61	0.61	0.61	
v/c Ratio	0.97	0.01	0.33	0.07	0.23	
Control Delay	74.5	18.8	10.8	8.7	1.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	74.5	18.8	10.8	8.7	1.9	
LOS	Е	В	В	Α	Α	
Approach Delay	74.0		10.8	3.4		
Approach LOS	Е		В	Α		
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

05-15-2023 JK **CGH Transportation** Page 1 Lanes, Volumes, Timings 1: Merivale & Leikin

Future Background 2026AM Peak Hour 50 Leikin Dr

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



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Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	7	7	7	<b>A</b>	£	05.1
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	409	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -	None	riee -	None	riee -	None
Storage Length	0	None 8	40	None -		None -
Veh in Median Storage	-	-	40	0	0	-
	9, # 0		-			
Grade, %				100	100	
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	1	Major2	
Conflicting Flow All	813	170	170	0	-	0
Stage 1	170	-	-	-		-
Stage 2	643	-	-	-	-	-
Critical Hdwv	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	0.22	7.12	-		-
Critical Hdwy Stg 2	5.42		_	_	_	-
Follow-up Hdwy		3.318	2 218			
Pot Cap-1 Maneuver	348	874	1407			
Stage 1	860	- 014	1407			
	523	-	-		-	
Stage 2	523	-	-	-	-	-
Platoon blocked, %	200			-	-	-
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	10.2 B		1.0		U	
I ICIVI EOS	D					
Minor Lane/Major Mvn	nt	NBL		EBLn1 I		SBT
Capacity (veh/h)		1407	-	0_0	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		Α	-	С	Α	-
HCM 95th %tile Q(veh	)	0.2	-	0.1	0.2	-

Int Delay, s/veh	Intersection												
Movement   EBL   EBT   EBR   WBL   WBT   WBR   NBL   NBT   NBR   SBL   SBT   SBR		26.1											
Traffic Vol, veh/h			ED-	EDD	MIDI	MOT	WDD	ND:	NDT	NDC	OD:	0.07	000
Traffic Vol, veh/h				EBK			WBR	NBL		NRK	SBL		SBR
Future Vol, veh/h    151   558											010		=0
Conflicting Peds, #hr													
Sign Control   Free   Free													
RT Channelized	•	-	-			-	-	_	_	_	_	-	
Storage Length   30			Free		Free	Free		Stop			Stop	Stop	
Veh in Median Storage, #         0         -         0         0         0         0         0         0         0         0         100         <			-		-			-		None	-	-	
Grade, %         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         -         0         0         100										-			
Peak Hour Factor						_				-		-	
Heavy Vehicles, % 3 2 2 2 29 35 2 2 2 25 2 33 2   Mumt Flow   151 558 4 7 20 37 1 2 4 213 3 56						-			-			-	
Major/Minor   Major1   Major2   Minor1   Minor2													
Major/Minor         Major1         Major2         Minor1         Minor2           Conflicting Flow All         57         0         0         567         0         0         949         938         565         918         922         39           Stage 1         -         -         -         -         -         867         867         -         53         53         -           Critical Hdwy         4.13         -         4.39         -         7.12         6.52         6.45         7.12         6.83         6.22           Critical Hdwy Stg 1         -         -         -         -         6.12         5.52         6.12         5.83         -           Critical Hdwy Stg 2         -         -         -         -         6.12         5.52         -         6.12         5.83         -           Critical Hdwy Stg 2         -         -         -         -         6.12         5.52         -         6.12         5.83         -           Follow-up Hdwy         2.227         -         2.461         -         3.518         4.018         3.252         240         1033           Stage 1         -         -													
Conflicting Flow All   57   0   0   567   0   0   949   938   565   918   922   39   Stage 1	WIVMT FIOW	151	558	4	- /	20	3/	- 1	2	4	213	3	90
Conflicting Flow All   57   0   0   567   0   0   949   938   565   918   922   39   Stage 1													
Stage 1	Major/Minor I	Major1			Major2			Minor1			Minor <sub>2</sub>		
Stage 1	Conflicting Flow All	57	0	0	567	0	0	949	938	565	918	922	39
Critical Hdwy         4.13         -         4.39         -         7.12         6.52         6.45         7.12         6.83         6.22           Critical Hdwy Stg 1         -         -         -         -         6.12         5.52         -         6.12         5.83         -           Critical Hdwy Stg 2         -         -         -         -         6.12         5.52         -         6.12         5.83         -           Follow-up Hdwy         2.227         -         2.461         -         3.518         4.018         3.525         3.518         4.297         3.318           Pot Cap-1 Maneuver         1541         -         884         -         -         240         264         483         252         240         1033         Stage 1         -         -         -         -         -         -         9.60         793         -         960         793         -         960         793         -         960         793         -         881         -         -         206         235         481         228         214         1033         Mov Cap-2 Maneuver         1541         -         881         -         -         2	Stage 1	-	-	-	-	-	-	867	867	-	53	53	-
Critical Hdwy Stg 1	Stage 2	-	-	-	-	-	-	82	71	-	865	869	-
Critical Hdwy Stg 2         -         -         -         6.12         5.52         6.12         5.83         -           Follow-up Hdwy         2.227         -         2.461         -         3.518         4.018         3.525         3.518         4.297         3.318           Pot Cap-1 Maneuver         1541         -         884         -         240         264         483         252         240         103           Stage 1         -         -         -         -         -         926         836         -         348         330         -           Platoon blocked, %         -         -         -         -         -         926         836         -         348         330         -           Platoon blocked, %         -         -         -         -         -         -         206         235         481         228         214         1033           Mov Cap-2 Maneuver         -         -         -         -         206         235         481         228         214         -         318         332         -         866         787         -         Stage 2         -         309         296	Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22
Follow-up Hdwy 2 .227 - 2.461 - 3.518 4.08 3.525 3.518 4.297 3.318 Pot Cap-1 Maneuver 1541 - 884 - 240 264 483 252 240 1033 Stage 1 3.48 3.70 - 960 793 - Stage 2	Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Pot Cap-1 Maneuver         1541         -         -         884         -         -         240         264         483         252         240         1033           Stage 1         -         -         -         -         -         348         370         -         960         793         -           Stage 2         -         -         -         -         926         836         -         348         330         -           Platoon blocked, %         - <td>Critical Hdwy Stg 2</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>6.12</td> <td>5.52</td> <td>-</td> <td>6.12</td> <td>5.83</td> <td>-</td>	Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Stage 1	Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318
Stage 2	Pot Cap-1 Maneuver	1541	-	-	884	-	-	240	264	483	252	240	1033
Platoon blocked, %	Stage 1	-	-	-	-	-	-	348	370	-	960	793	-
Mov Cap-1 Maneuver         1541         -         -         881         -         -         206         235         481         228         214         1033           Mov Cap-2 Maneuver         -         -         -         -         -         206         235         -         228         214         -           Stage 1         -         -         -         -         -         313         332         -         866         787         -           Stage 2         -         -         -         -         -         366         829         -         309         296         -           Approach         EB         WB         NB         SB         B <td>Stage 2</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>926</td> <td>836</td> <td>-</td> <td>348</td> <td>330</td> <td>-</td>	Stage 2	-	-	-	-	-	-	926	836	-	348	330	-
Mov Cap-2 Maneuver         -         -         -         -         206         235         -         228         214         -           Stage 1         -         -         -         -         313         332         866         787         -           Stage 2         -         -         -         -         866         829         -         309         296         -           Approach         EB         WB         NB         SB         B         NB         SB         B         HCM LOM Control Delay, s         1.6         1         16.4         96.6         GC         F         F           Minor Lane/Major Mvmt         NBLn1         EBL         EBT         EBR         WBL         WBT         WBR SBLn1         WBR SBLn1         Capacity (veh/n)         -         271         HCM Lane V/C Ratio         0.022         0.098         -         0.008         -         1.004         HCM Lane LOS         0         0         -         9.1         -         96.6         HCM Lane LOS         C         A         -         A         -         -         F	Platoon blocked, %		-	-		-	-						
Stage 1	Mov Cap-1 Maneuver	1541	-	-	881	-	-	206	235	481	228	214	1033
Stage 2	Mov Cap-2 Maneuver	-	-	-	-	-	-			-			-
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	Stage 1	-	-	-	-	-	-			-			-
HCM Control Delay, s   1.6	Stage 2	-	-	-	-	-	-	866	829	-	309	296	-
HCM Control Delay, s   1.6													
HCM Control Delay, s   1.6	Annroach	ED			WP			NP			SB		
HCM LOS													
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		1.0			- 1								
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         -         -         9.6           HCM Lane LOS         C         A         -         A         -         F	I IOWI LUO							C			г		
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         -         -         9.6           HCM Lane LOS         C         A         -         A         -         F													
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		nt							WBR				
HCM Control Delay (s) 16.4 7.6 9.1 96.6 HCM Lane LOS C A A F					-	-		-	-				
HCM Lane LOS C A A F	HCM Lane V/C Ratio				-	-		-	-				
	HCM Control Delay (s)				-	-		-	-				
HCM 95th %tile Q(veh) 0.1 0.3 0 10.2	HCM Lane LOS				-	-		-	-				
	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

	•	7	1	<b>†</b>	. ↓	
Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations	*	7	*	<b></b>	<b>†</b> 13	
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	В	Α	Α	Α	
Approach Delay	13.6			3.5	5.4	
Approach LOS	В			Α	Α	
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

05-15-2023 JK **CGH Transportation** Page 7 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 Capacity Utilization 72.0% Analysis Period (min) 15 Intersection LOS: A ICU Level of Service C

Splits and Phases: 5: Prince of Wales & Merivale



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1	uture	Dackground	ZUZUAIVI	r cak i loui
				50 Leikin Dr

LIBI (I	0.0						_
Int Delay, s/veh	2.6						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	Γ
Lane Configurations	ሻ	7	ĥ		ሻ	<b>†</b>	1
Traffic Vol, veh/h	100	4	308	20	29	227	7
Future Vol, veh/h	100	4	308	20	29	227	7
Conflicting Peds, #/hr	0	0	0	0	0	0	)
Sign Control	Stop	Stop	Free	Free	Free	Free	Э
RT Channelized	-	None	-	None	-	None	9
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	1
Mvmt Flow	100	4	308	20	29	227	7

Major/Minor	Minor1	N	lajor1	N	//ajor2	
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	

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

Minor Lane/Major Mvmt	NBT	NBR\	VBLn1\	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	-	-	С	В	Α	-
HCM 95th %tile Q(veh)	_	-	0.8	0	0.1	-

~ ^ ^ ^ <i>&gt;</i> >	
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	- 0
Minimum Initial (s) 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%	36.6%
Maximum Green (s) 20.0 20.0 30.0 30.0 30.0 30.0	30.0%
Yellow Time (s) 20.0 20.0 30.0 30.0 30.0 Yellow Time (s) 3.3 3.7 3.7 3.7	30.0
	2.7
(4)	
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 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	102.0
Base Capacity (vph) 543 445 842 984 1016	1415
Starvation Cap Reductn 0 0 0 0 0	1415
Spillback Cap Reductr 0 0 0 0 0	0
Storage Cap Reductri 0 0 0 0 0	0
ettings cap i terrain	
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

#### Lanes, Volumes, Timings 13: Leikin & RCMP

#### Future Background 2026AM Peak Hour 50 Leikin Dr

Maximum v/c Ratio: 0.56 Intersection Signal Delay: 8.1 Intersection LOS: A Intersection Capacity Utilization 63.3% Analysis Period (min) 15 ICU Level of Service B Splits and Phases: 13: Leikin & RCMP V<sub>Ø1</sub> Ø6

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Lanes, Volumes, Timings 1: Merivale & Leikin

Future Background 2026PM Peak Hour 50 Leikin Dr

	•	*	1	1	ļ	4	
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations	*	7	ች	<b></b>	<b>*</b>	7	
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	В	Α	В	В	Α	
Approach Delay	38.4			10.3	9.4		
Approach LOS	D			В	Α		
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

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### Lanes, Volumes, Timings 1: Merivale & Leikin

### Future Background 2026PM Peak Hour 50 Leikin Dr

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

Splits and Phases: 1: Merivale & Leikin			
<b>↑</b> Ø2	<b>●</b> ø3	<b>₹</b> Ø4	
46.5 s	8 s	30.1s	
<b>∜</b> Ø6			
AC To			

 05-15-2023
 CGH Transportation

 JK
 Page 2

#### HCM 2010 TWSC 3: Merivale & Beckstead

HCM Lane V/C Ratio

HCM Control Delay (s)

HCM 95th %tile Q(veh)

HCM Lane LOS

0.044

- 0.021 0.233

- 0.1 0.9

- 15.9 12.8 - -

- C B - -

Future Background 2026PM Peak Hour 50 Leikin Dr

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	75	7	7	<b>†</b>	ĵ,	
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	e. # 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	5	2	2
Mymt Flow	7	140	48	251	459	0
	•					-
	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		3.318		-	-	-
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	
			1.4		0	
HCM Control Delay, s	12.9		1.4		0	
HCM LOS	В					
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1 8	EBLn2	SBT
Capacity (veh/h)		1102	-	336	602	-

4.9

Int Delay, s/veh

HCM 95th %tile Q(veh)

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	- 1	ß		ሻ	ß			4			4		
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 I	Major1		- 1	Major2		- 1	Minor1		1	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				-			С			С			
Minor Lane/Major Mvm	it I	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR:	SRI n1				
Capacity (veh/h)		317	1020	LUI	LDIN	1523	WD1	WDI()	537				
HCM Lane V/C Ratio		0.003	0.064		- :	1020	- 1		0.426				
HCM Control Delay (s)		16.4	8.8			0			16.6				
HCM Lane LOS		10.4 C	ο.ο		- :	A	- 1		10.0				
I IOW LAIR LUS		U	А	-	-	А	-	_	U				

0 - - 2.1

0 0.2 - -

50 Leikin Dr

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

Future Background 2026PM Peak Hour

50 Leikin Dr

- 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.

Quede shown is maximum after two cycles.

Splits and Phases: 5: Prince of Wales & Merivale



HCM 2010 TWSC 8: Leikin & Beckstead

HCM Lane V/C Ratio

HCM Lane LOS

HCM Control Delay (s)

HCM 95th %tile Q(veh)

Future Background 2026PM Peak Hour 50 Leikin Dr

Intersection						
IIICISECUOII						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		- 7	Þ			<u></u>
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
Grade, %	0	400	0	400	400	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	- 1	Major1	ı	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			-	-	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	В					
	В					
HCM LOS		NDT	NIDEN	MDI ss411	VDI ~O	CDI
		NBT	NBRV	<u>VBLn1V</u> 481	VBLn2 756	SBL 1217

- 0.089 0.008 0.024

- - 13.2 9.8 8

- - B A A

- - 0.3 0 0.1

Lanes, Volumes, Timings 13: Leikin & RCMP

Future Background 2026PM Peak Hour 50 Leikin Dr

	€	*	<b>†</b>	-	-	<b>↓</b>
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	<b>†</b>	7	*	<b>1</b>
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
( )	0.7	0.7			Lead	0.4
Lead/Lag			Lag Yes	Lag	Yes	
Lead-Lag Optimize?	2.0	2.0		Yes		2.0
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	Α	В	Α	В	В
Approach Delay	35.7		13.0			11.5
Approach LOS	D		В			В
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	020	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
Nouvoca We Natio	0.73	0.40	0.09	0.01	0.01	0.19

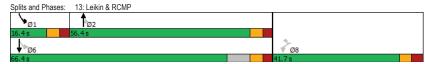
#### Intersection Summary

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

05-15-2023 JK CGH Transportation Page 11 Lanes, Volumes, Timings 13: Leikin & RCMP

Future Background 2026PM Peak Hour 50 Leikin Dr

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



CGH Transportation Page 12 05-15-2023 JK

#### **MOVEMENT SUMMARY**

(Site Folder: General)]

50 Leikin Dr Site Category: (None) Roundabout

Vehi	cle Mo	vement	Perfor	mance										
Mov ID	Turn	INP VOLU [Total veh/h		DEM, FLO [ Total veh/h		Deg. Satn v/c		Level of Service	95% BA QUE [ Veh. veh	ACK OF EUE Dist ] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Sout	h: Bill L	eathem												
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
Appr	oach	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 Ad	ccess 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	8.0	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
Appr	oach	119	2.0	119	2.0	0.096	0.8	LOSA	0.5	3.3	0.32	0.17	0.32	38.9
Norti	n: Site A	ccess 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
Appr	oach	120	2.0	120	2.0	0.106	1.3	LOS A	0.5	3.9	0.43	0.28	0.43	44.1
Wes	: Longf	ields												
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
Appr	oach	270	6.0	270	6.0	0.215	5.4	LOSA	1.2	9.0	0.35	0.53	0.35	53.5
All V	ehicles	679	4.3	679	4.3	0.215	4.4	LOSA	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.

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#### **MOVEMENT SUMMARY**

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

50 Leikin Dr

Site Category: (None)
Roundabout

Mov ID	Turn	INP VOLU		DEM. FLO		Deg.		Level of	95% BA			Effective	Aver.	Ave
טו		Total veh/h	HV]	Total veh/h	ws HV] %	Satn v/c	sec	Service	QUE [ Veh. veh	Dist]	Que	Stop Rate	No. Cycles	Spee km/
South	: Bill Le	eathem												
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.
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.
3	R2	1	2.0	1	2.0	0.164	4.6	LOSA	0.9	6.5	0.03	0.59	0.03	36
Appro	ach	280	3.0	280	3.0	0.164	7.4	LOSA	0.9	6.5	0.03	0.59	0.03	51.
East:	Site Ac	cess 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	T1	42	2.0	42	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	41
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
Appro	ach	120	2.0	120	2.0	0.104	1.3	LOS A	0.5	3.7	0.41	0.26	0.41	38
North	: Site A	ccess 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
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	R2	42	2.0	42	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	48
Appro	ach	120	2.0	120	2.0	0.114	1.9	LOS A	0.6	4.3	0.50	0.36	0.50	43
West:	Longfi	elds												
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
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
12	R2	153	10.0	153	10.0	0.129	5.4	LOSA	0.7	5.2	0.34	0.53	0.34	53
Appro	ach	155	9.9	155	9.9	0.129	5.5	LOS A	0.7	5.2	0.34	0.53	0.34	53

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.

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# 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

	•	•	<b>†</b>	Ţ	1	
Lane Group	EBL	EBR	NBT	SBT	SBR	Ø3
Lane Configurations	*	7	<b>A</b>	<u> </u>	7	
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	Ū
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	0.0	0.0	0.5	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	MINI	7.0	7.0	3.0
	10.0	10.0		21.0	21.0	0.0
Flash Dont Walk (s) Pedestrian Calls (#/hr)	0.0	10.0		21.0	21.0	
			60.4			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	В	В	A	Α	
Approach Delay	74.0		10.8	3.5		
Approach LOS	Е		В	Α		
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						
O l						

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

05-15-2023 JK CGH Transportation Page 1 Lanes, Volumes, Timings 1: Merivale & Leikin

Future Background 2031AM Peak Hour 50 Leikin Dr

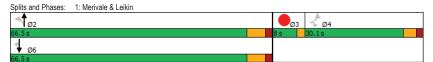
Maximum v/c Ratio: 0.97 Intersection Signal Delay: 33.3

Intersection LOS: C

ICU Level of Service A

Intersection Capacity Utilization 53.3% ICI
Analysis Period (min) 15

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



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JK

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		7	ሻ	<b>†</b>	ĵ.	
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	e,# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	4	7	100
Mymt Flow	6	42	102	439	178	1
Major/Minor	Minor2		Major1	, n	Major2	
Conflicting Flow All	822	179	179	0	viajuiz -	0
Stage 1	179	1/9	1/9	-	-	-
	643					
Stage 2 Critical Hdwy	6.42	6.22	4.12		-	
	5.42	0.22	4.12	-	-	
Critical Hdwy Stg 1	5.42		-	-	-	-
Critical Hdwy Stg 2		2 240	0.040	-	-	-
Follow-up Hdwy Pot Cap-1 Maneuver	3.518	3.318 864	1397	-	-	-
	852	004	1397		-	-
Stage 1		-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %	040	004	4007		-	-
Mov Cap-1 Maneuver		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	В					
Miner Lene/Maier Mus	na b	NDI	NDT	EDI =4 [	-DI2	CDT
Minor Lane/Major Mvr	nt	NBL	MBT	EBLn1 E		SBT
Capacity (veh/h)		1397	-	319	864	-
HCM Lane V/C Ratio		0.073		0.019		-
HCM Control Delay (s	)	7.8	-	16.5	9.4	-
HCM Lane LOS		A	-	С	A	-
HCM 95th %tile Q(veh	1)	0.2	-	0.1	0.2	-

Intersection												
Int Delay, s/veh	26.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	ĵ.		7	ĵ,			4			4	
Traffic Vol, veh/h	151	558	4	7	20	37	1	2	4	213	3	56
Future Vol. veh/h	151	558	4	7	20	37	1	2	4	213	3	56
Conflicting Peds, #/hr	0	0	5	5	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	30	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage	,# -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	3	2	2	29	35	2	2	2	25	2	33	2
Mvmt Flow	151	558	4	7	20	37	1	2	4	213	3	56
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	57	0	0	567	0	0	949	938	565	918	922	39
Stage 1	-	-	-	-	-	-	867	867	-	53	53	-
Stage 2			-	-	-		82	71	-	865	869	-
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318
Pot Cap-1 Maneuver	1541	-	-	884	-	-	240	264	483	252	240	1033
Stage 1	-	-	-	-	-	-	348	370	-	960	793	-
Stage 2	-	-	-	-	-	-	926	836	-	348	330	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1541	-	-	881	-	-	206	235	481	228	214	1033
Mov Cap-2 Maneuver	-	-	-	-	-	-	206	235	-	228	214	-
Stage 1	-	-	-	-	-	-	313	332	-	866	787	-
Stage 2	-	-	-	-	-	-	866	829	-	309	296	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.6			1			16.4			96.6		
HCM LOS	1.0						С			F		
Minor Lane/Major Mvm	nt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBI n1			
Capacity (veh/h)		323	1541		LOIN	881		TTDIC	271			
HCM Lane V/C Ratio		0.022	0.098			0.008	- 1		1.004			
HCM Control Delay (s)		16.4	7.6			9.1			96.6			
HCM Lane LOS		C	Α.	-		Α.	-		50.0			
במווס בסס			/ \			/ \						

0.1 0.3 - - 0 - - 10.2

HCM 95th %tile Q(veh)

Lanes, Volumes, Timings 5: Prince of Wales & Merivale Future Background 2031AM Peak Hour 50 Leikin Dr

	•	*	1	<b>†</b>	↓	
Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations	*	7	*	<b>A</b>	<b>↑</b> 13-	
Traffic Volume (vph)	10	118	452	994	259	
Future Volume (vph)	10	118	452	994	259	
Lane Group Flow (vph)	10	118	452	994	297	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.4	90.2	95.3	74.7	
Actuated g/C Ratio	0.10	0.12	0.90	0.95	0.75	
v/c Ratio	0.06	0.46	0.51	0.60	0.13	
Control Delay	41.8	11.2	3.5	3.9	5.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.8	11.2	3.5	3.9	5.4	
LOS	D	В	Α	Α	Α	
Approach Delay	13.6			3.8	5.4	
Approach LOS	В			Α	Α	
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 Cummens						

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

05-15-2023 JK **CGH Transportation** Page 7 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 Capacity Utilization 74.6% Analysis Period (min) 15 Intersection LOS: A ICU Level of Service D

Splits and Phases: 5: Prince of Wales & Merivale



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Intersection						
Int Delay, s/veh	2.6					
· · · · · · · · · · · · · · · · · · ·						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	7	7	ĥ		7	<b>↑</b>
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	٨	/lajor1	N	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	0.22	-			
Critical Hdwy Stg 2	5.42	_	-	-	-	-
Follow-up Hdwy		3.318			2.218	
Pot Cap-1 Maneuver	462	723	-	-		-
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			0		0.9	
HCM LOS	C		U		0.0	

Minor Lane/Major Mvmt	NBT	NBR\	VBLn1\	NBLn2	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	-	-	С	В	Α	-
HCM 95th %tile Q(veh)	-	-	0.8	0	0.1	-

	•	•	<b>†</b>	1	1	Ţ
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	<b></b>	7	*	<b>†</b>
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	0.1	0.1	Lag	Lag	Lead	0.7
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	140116	IVICA
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	0.10	0.10	0.49	0.49	0.74	0.73
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	20.5 C	13.4 B	13.0 B	4.3 A	δ.0	4.0 A
Approach Delay	19.8	О	8.4	А	A	5.8
Approach LOS	19.0 B		0.4 A			5.0 A
	_	0.0		0.0	10.0	1.9
Queue Length 50th (m)	1.8 6.8	4.9	25.8 58.5	0.0 20.4	10.8	6.7
Queue Length 95th (m) Internal Link Dist (m)	73.5	4.9	58.5 75.1	20.4	20.4	162.3
	/3.5		75.1	120.0	150.0	102.3
Turn Bay Length (m)	E40	445	842	130.0 984	150.0	1415
Base Capacity (vph)	543	445			1016	
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

#### Lanes, Volumes, Timings 13: Leikin & RCMP

#### Future Background 2031AM Peak Hour 50 Leikin Dr

Maximum v/c Ratio: 0.56 Intersection Signal Delay: 8.1 Intersection LOS: A Intersection Capacity Utilization 63.3% Analysis Period (min) 15 ICU Level of Service B Splits and Phases: 13: Leikin & RCMP V<sub>Ø1</sub> Ø6

05-15-2023 JK CGH Transportation Page 12 Lanes, Volumes, Timings 1: Merivale & Leikin

Future Background 2031PM Peak Hour 50 Leikin Dr

	•	*	1	<b>†</b>	ļ	4	
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3
Lane Configurations	*	7	ች	<b>^</b>	<b>†</b>	7	
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	В	Α	В	В	Α	
Approach Delay	38.4			10.3	9.4		
Approach LOS	D			В	Α		
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)	001.12	240.0	120.0	020.0	101.0	115.0	
Base Capacity (vph)	568	265	445	922	976	923	
Starvation Cap Reductn	0	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	
	0.00	0.01	0.00	0.20	0.40	0.20	

Intersection Summary

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

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### Lanes, Volumes, Timings 1: Merivale & Leikin

### Future Background 2031PM Peak Hour 50 Leikin Dr

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

 05-15-2023
 CGH Transportation

 JK
 Page 2

#### HCM 2010 TWSC 3: Merivale & Beckstead

HCM Control Delay (s)

HCM 95th %tile Q(veh)

HCM Lane LOS

Future Background 2031PM Peak Hour 50 Leikin Dr

Intersection							
Intersection Int Delay, s/veh	2.5						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	ሻ	7	ሻ		Դ		
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	-	
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	0.22	7.12		-		
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	- 002	1102				
Stage 2	706						
Platoon blocked, %	700				- 1		
Mov Cap-1 Maneuver	330	602	1102				
Mov Cap-1 Maneuver		002	1102				
Stage 1	608						
Stage 2	706	- :	- 1		- 1		
Glage 2	700						
Approach	EB		NB		SB		
HCM Control Delay, s			1.3		0		
HCM LOS	В						
Minor Lane/Major Mvr	nt	NBL	NRT	EBLn1 I	FRI n2	SBT	SBR
Capacity (veh/h)	iii.	1102	-	330	602	001	-
HCM Lane V/C Ratio		0.044		0.021			
LICM Control Dolor (a	Λ	0.044			12.0		_

8.4 - 16.1 12.8 - -

- 0.1 0.9

- C B - -

HCM 95th %tile Q(veh)

Interception												
Intersection	4.9											
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	ĵ.		7	ĥ			4			4	
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 I	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	548	0	0	67	0	0	747	745	67	645	654	458
Stage 1	J <del>4</del> 0	-	-	-	-	-	197	197	- 01	457	457	430
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	7.12			7.12			6.12	5.52	0.22	6.12	5.52	0.22
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, %						-	0.0	0.1		0.1		
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	-
, in the second												
Approach	EB			WB			NB			SB		
HCM Control Delay, s	4.7			0			16.4			16.6		
HCM LOS	7.1			0			10.4 C			10.0		
Minor Lane/Major Mvm	t	NBLn1	EBL	EBT	EBR	WBL	WBT	WRD	SBLn1			
Capacity (veh/h)		317	1020	LDI	LDIX	1523	VVD1	WOIN	537			
HCM Lane V/C Ratio		0.003	0.064	- 1	- :	1020			0.426			
HCM Control Delay (s)		16.4	8.8		-	0	-	-	16.6			
HCM Lane LOS		10.4 C	0.0 A	- 1	- :	A			10.0			
HOM OF LOS		0	A			Α .			0.4			

			٠,			
Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations	*	7	ሻ	<b>*</b>	<b>∱</b> î>	
Traffic Volume (vph)	30	533	184	334	981	
Future Volume (vph)	30	533	184	334	981	
Lane Group Flow (vph)	30	533	184	334	997	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	26.0	14.0	14.0	89.0	75.0	5.0
Total Split (%)	21.7%	11.7%	11.7%	74.2%	62.5%	4%
Maximum Green (s)	19.2	7.6	7.6	82.5	68.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead	0.0	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	110110	110110	O max	7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0.0
Act Effct Green (s)	10.1	34.8	103.5	106.0	68.5	J
Actuated g/C Ratio	0.08	0.29	0.86	0.88	0.57	
v/c Ratio	0.00	0.23	0.32	0.00	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	55.5 E	67.7	3.5 A	2.4 A	17.1 B	
Approach Delay	67.0			2.8	17.1	
Approach LOS	07.0			2.0 A	В	
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	#111.4	12.0	333.0	741.3	
Turn Bay Length (m)	135.0		120.0	333.0	141.3	
Base Capacity (vph)	262	537	576	1541	1889	
Starvation Cap Reductn	202	0	0	1541	1009	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.99	0.32	0.22	0.53	

Intersection Summary

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

0 0.2 - - 0 - - 2.1

Future Background 2031PM Peak Hour 50 Leikin Dr HCM 2010 TWSC Future Background 2031PM Peak Hour 8: Leikin & Beckstead

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	
<ul> <li>Volume exceeds capacity, queue is theoretically infinite.</li> </ul>	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be le	onger.
Ougue chown is maximum after two cycles	

Splits and Phases: 5: Prince of Wales & Merivale



Intersection			_			
Int Delay, s/veh	1.4					
		WDD	NDT	NDD	CDI	SBT
Movement	WBL	WBR	NBT	NBR	SBL	
Lane Configurations	ነሻ	7	<b>1</b>	440	<b>ሻ</b>	1012
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 Storag		-	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		Anior4		Majora	
Major/Minor			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		-			
0.030 2	. 50					
Approach	WB		NB		SB	
HCM Control Delay, s	12.8		0		1	
HCM LOS	В					
Minor Long/Major Ma	mt	NDT	NIDDI	MDI n41	MDI 50	CDI
Minor Lane/Major Mvr	ш	NBT	NDRI	WBLn1V		SBL
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		-	-	В	Α	Α

Minor Lane/Major Mvmt	NBT	NBR\	WBLn1V	VBLn2	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	-	-	В	Α	Α	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0.1	-

50 Leikin Dr

Lanes, Volumes, Timings 13: Leikin & RCMP

Future Background 2031PM Peak Hour 50 Leikin Dr

	•	4	†	~	<b>\</b>	<b>+</b>
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	ች	7	<b>†</b>	7	*	<b>1</b>
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	0.1	0.1	Lag	Lag	Lead	0.7
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	140116	HIGA
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	0.29	0.23	0.09	0.01	0.01	0.33
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	55.9 D	0.2 A	13.3 B	9.0 A	10.5 B	11.0 B
Approach Delay	35.7	A	13.0	A	Б	11.5
Approach LOS	33.7 D		13.0 B			11.5 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	17.3	75.0	2.1	2.4	162.3
Turn Bay Length (m)	13.5		75.0			102.3
	563	629	930	807	693	1113
Base Capacity (vph)					093	
Starvation Cap Reductn 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

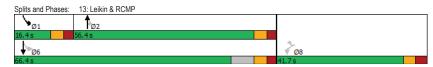
#### Intersection Summary

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

05-15-2023 JK CGH Transportation Page 11 Lanes, Volumes, Timings 13: Leikin & RCMP

Future Background 2031PM Peak Hour 50 Leikin Dr

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



CGH Transportation Page 12 05-15-2023 JK

#### **MOVEMENT SUMMARY**

(Site Folder: General)]

50 Leikin Dr Site Category: (None) Roundabout

South: 1 2 3	L2 T1 R2	VOLU [Total veh/h eathem 168 1	MES HV] % 5.0 2.0	FLO' [ Total veh/h	WS HV] %	Satn v/c	Delay sec	Service	QUE [ Veh. veh	EUE Dist] m	Que	Stop Rate	No. Cycles	Speed km/h
1	L2 T1 R2	veh/h eathem 168	5.0	veh/h 168	% -		sec					Rate	Cycles	km/h
1	L2 T1 R2	168 1			5.0									
2	T1 R2	1			5.0									
	R2		2.0			0.102	7.4	LOS A	0.5	3.9	0.03	0.59	0.03	51.1
3		1		1	2.0	0.102	7.2	LOS A	0.5	3.9	0.03	0.59	0.03	39.9
			2.0	1	2.0	0.102	4.6	LOS A	0.5	3.9	0.03	0.59	0.03	36.1
Approa	acn	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: S	Site Ac	cess 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	8.0	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
Approa	ach	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 A	ccess 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
Approa	ach	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: I	Longfi	elds												
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
Approa	ach	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 Veh	nicles	679	4.3	679	4.3	0.215	4.4	LOSA	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).

 ${\bf Roundabout\ LOS\ Method:\ SIDRA\ Roundabout\ LOS.}$ 

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.

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#### **MOVEMENT SUMMARY**

Site: 101 [Longfields-Bill Leathern BG 2026 & 2031 PM Peak

(Site Folder: General)]

50 Leikin Dr Site Category: (None)

Roundabout

Mov ID	Turn	INP VOLU		DEM FLO		Deg. Satn		Level of Service	95% BA QUE		Prop. Que	Effective Stop	Aver. No.	Aver. Speed
		[ Total veh/h	HV]	[ Total veh/h	HV] %	v/c			[ Veh.	Dist]	Que	Rate	Cycles	
South	o: Bill L	eathem	70	ven/n	70	V/C	sec		veh	m				km/l
1	L2	278	3.0	278	3.0	0.164	7.4	LOSA	0.9	6.5	0.03	0.59	0.03	51.5
2	T1	1	2.0	1	2.0	0.164	7.4	LOSA	0.9	6.5	0.03	0.59	0.03	39.9
3	R2	1	2.0	11	2.0	0.164	4.6	LOSA	0.9	6.5	0.03	0.59	0.03	36.1
Appro	oach	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 Ad	cess 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	LOSA	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
Appro	oach	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 A	ccess 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	LOSA	0.6	4.3	0.50	0.36	0.50	48.1
Appro	oach	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	: Longfi	ields												
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
Appro	oach	155	9.9	155	9.9	0.129	5.5	LOS A	0.7	5.2	0.34	0.53	0.34	53.5
A II 3 /	ehicles	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.

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# 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

	<i>•</i>	*	1	1	Į.	4		
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3	
Lane Configurations	*	7	*	<b>*</b>	<b>†</b>	7		
Traffic Volume (vph)	428	7	4	354	65	254		
Future Volume (vph)	428	7	4	354	65	254		
Lane Group Flow (vph)	428	7	4	354	65	254		
Turn Type	Perm	Perm	Perm	NA	NA	Perm		
Protected Phases				2	6		3	
Permitted Phases	4	4	2			6		
Detector Phase	4	4	2	2	6	6		
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0	
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0	
Total Split (s)	30.1	30.1	66.5	66.5	66.5	66.5	8.0	
Total Split (%)	28.8%	28.8%	63.6%	63.6%	63.6%	63.6%	8%	
Maximum Green (s)	25.0	25.0	60.0	60.0	60.0	60.0	6.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0	
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5		
Lead/Lag	Lag	Lag					Lead	
Lead-Lag Optimize?	Yes 3.0	Yes 3.0	3.0	3.0	3.0	3.0	Yes 3.0	
Vehicle Extension (s) Recall Mode	None	None	Max	Max	Max	Max	None	
Walk Time (s)	7.0	7.0	IVIAX	IVIAX	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	0.01			21.0	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	В	Α	В	A	Α		
Approach Delay	84.1		7.	10.8	3.3	7.		
Approach LOS	F			В	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

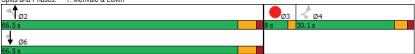
05-16-2023 JK **CGH Transportation** Page 1 Lanes, Volumes, Timings 1: Merivale & Leikin

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
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles. ICU Level of Service A

Splits and Phases: 1: Merivale & Leikin



05-16-2023 CGH Transportation JK Page 2

Intersection Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	ሻ	7		<b>†</b>	₽	
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	e, # 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	5	9	100
Mymt Flow	6	51	115	443	172	1
Maria d'Adina d	M:		M=!==4		4-:0	
	Minor2		Major1		Major2	
Conflicting Flow All	846	173	173	0	-	0
Stage 1	173	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy		3.318		-	-	-
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	-	-			-
Olago 2						
Approach	EB		NB		SB	
HCM Control Delay, s			1.6		0	
HCM LOS	В					
Minor Lane/Major Mvn	nt	NBL	NRT	EBLn1 8	FRI n2	SBT
Capacity (veh/h)	iit.	1404	INDI	306	871	ODI
HCM Lane V/C Ratio		0.082			0.059	
HCM Control Delay (s	١	7.8		17	9.4	
, ,	)			17 C		-
HCM Lane LOS	. \	A	-		A	-
HCM 95th %tile Q(veh	1)	0.3	-	0.1	0.2	-

Interpostion												
Intersection	32.6											
Int Delay, s/veh	32.0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	ĵ.		7	ĵ.			4			4	
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	e.# -	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
Mymt Flow	160	575	4	7	29	39	1	2	4	213	3	65
WITHIE I IOW	100	010	-		20	00		_	-	210	U	00
	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	68	0	0	584	0	0	999	984	582	963	967	49
Stage 1	-	-	-	-	-	-	902	902	-	63	63	-
Stage 2	-	-	-	-	-	-	97	82	-	900	904	-
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.83	-
Follow-up Hdwy	2.227	-	-	2.461	-	-	3.518	4.018	3.525	3.518	4.297	3.318
Pot Cap-1 Maneuver	1527	-	-	870	-	-	222	248	472	235	226	1020
Stage 1	-	-	-	-	-	-	332	356		948	785	-
Stage 2	-	-	_	-	-	_	910	827		333	317	_
Platoon blocked, %		-	-			-					• • • •	
Mov Cap-1 Maneuver	1527	_	_	867		_	187	219	470	~ 212	200	1020
Mov Cap-2 Maneuver	-			-			187	219		~ 212	200	.020
Stage 1	-	-	-	-	-	-	296	317		848	779	
Stage 2						-	842	820		294	282	
Olugo 2							012	020		201	LUL	
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.7			0.9			17.1			122.6		
HCM LOS							С			F		
Minor Lane/Major Mvn	nt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	CRI n1			
Capacity (veh/h)	IIL	304	1527	LDI	LDIN	867	WDI	WDIX	259			
. , , ,				-	-		-	-	1.085			
HCM Cantrol Polario		0.023	0.105	-	-	0.008	-	-				
HCM Control Delay (s)	)	17.1	7.6	-	-			-	122.6			
HCM Lane LOS	,	С	A	-	-	A	-	-	F			
HCM 95th %tile Q(veh	1)	0.1	0.3	-	-	0	-	-	11.7			
Notes												
~: Volume exceeds ca	nacity	\$: De	elav exc	eeds 30	)Os -	+: Com	nutation	Not De	efined	*· All	major v	olume i
. Volumo oxoccus cu	puolty	Ų. DO	nay ono	0000 00	,00	·. Comp	Jululioi	THOU DO	Jiii iou	· Au	iliajoi v	Oldillo I

Lanes, Volumes, Timings 5: Prince of Wales & Merivale Future Total 2026AM Peak Hour 50 Leikin Dr

	•	*	1	<b>†</b>	. ↓	
Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations	*	7	*	<b>†</b>	<b>†</b> 19	
Traffic Volume (vph)	10	126	469	946	259	
Future Volume (vph)	10	126	469	946	259	
Lane Group Flow (vph)	10	126	469	946	297	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.5	90.2	95.3	74.6	
Actuated g/C Ratio	0.10	0.12	0.90	0.95	0.75	
v/c Ratio	0.06	0.46	0.53	0.57	0.13	
Control Delay	41.8	10.8	3.7	3.5	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.8	10.8	3.7	3.5	5.6	
LOS	D	В	Α	Α	Α	
Approach Delay	13.1			3.6	5.6	
Approach LOS	В			Α	Α	
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	
Intono ation ()						

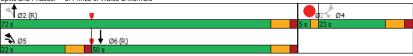
Intersection Summary

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

05-16-2023 JK **CGH Transportation** Page 8 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 Capacity Utilization 72.0% Analysis Period (min) 15 Intersection LOS: A ICU Level of Service C

Splits and Phases: 5: Prince of Wales & Merivale



05-16-2023 CGH Transportation JK Page 9

-						
Intersection						
Int Delay, s/veh	0.9					
**						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Þ			ની
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	e, # 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
	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					
Olago Z	717					
Approach	WB		NB		SB	
HCM Control Delay, s	10.3		0		0.7	
HCM LOS	В					
Miner Lene/Meier Mum		NDT	NDD	WBLn1	SBL	SBT
Minor Lane/Major Mvm	IL	NBT				
Capacity (veh/h)		-	-	700	1391	-
HCM Lane V/C Ratio		-	-	0.001		-
HCM Control Delay (s)		-	-	10.3	7.6	0
HCM Lane LOS		-	-	В	Α	Α
HCM 95th %tile Q(veh	)	-	-	0.1	0.1	-

Intersection						
Int Delay, s/veh	0.7					
-	• • • •					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4₽	₽		¥	
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
Mymt Flow	17	775	66	34	23	9
			- 00	01		
	/lajor1	1	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	-
	2.219				3.519	
Pot Cap-1 Maneuver	1492				511	976
Stage 1	1702				940	310
Stage 2					630	
					030	-
Platoon blocked, %	4.400	-	-	-	F04	070
Mov Cap-1 Maneuver	1492	-	-	-	501	976
Mov Cap-2 Maneuver	-	-	-	-		-
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	630	-
Approach	EB		WB		SB	
HCM Control Delay, s	0.3		0		11.6	
HCM LOS					В	
Minor Lane/Major Mvmt		EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)		1492	-	-	- VVDIX	580
HCM Lane V/C Ratio		0.011				0.055
HCM Control Delay (s)		7.4	0.1	-	-	11.6
HCM Lane LOS		A	Α	-	-	В
HCM 95th %tile Q(veh)		0	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.8					
	WDI	WDD	NDT	NDD	ODI	CDT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	142	7	<b>}</b>	00	<b>\</b>	<b>↑</b>
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
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
Malaulkinaa	Minand		A-:4		M-:0	
	Minor1		Major1		Major2	_
Conflicting Flow All	660	345	0	0	359	0
Stage 1	345	-	-	-	-	-
Stage 2	315	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518		-	-	2.218	-
Pot Cap-1 Maneuver	428	698	-	-	1200	-
Stage 1	717	-	-	-	-	-
Stage 2	740	-		_		-
Platoon blocked, %						-
Mov Cap-1 Maneuver	418	698	-	-	1200	-
Mov Cap-2 Maneuver	418	-				
Stage 1	717		_	_		
Stage 2	722					
Olage 2	122					
Approach	WB		NB		SB	
HCM Control Delay, s	16.6		0		0.8	
HCM LOS	С					
Miner Lone/Major M.	a.k	NDT	NDD	MDI w41	V/D1 ~0	CDI
Minor Lane/Major Mvn	IL	NBT	MRKA	VBLn1\		SBL
Capacity (veh/h)		-	-	418	698	1200
HCM Lane V/C Ratio		-	-		0.006	
HCM Control Delay (s)		-	-	16.8	10.2	8.1
HCM Lane LOS		-	-	С	В	Α
HCM 95th %tile Q(veh	)	-	-	1.1	0	0.1

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WDL.	WDIX	13	NDIX	ODL	4
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	230
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	- 0	-	- 1	-
Veh in Median Storage	-	-	0		_	0
Grade, %	0		0			0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	100	6	100	100	2
Mymt Flow	0	3	190	2	4	298
IVIVIIIL I IOW	U	J	130		*	230
Major/Minor	Minor1	- 1	Major1		Major2	
Conflicting Flow All	497	191	0	0	192	0
Stage 1	191	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.42	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	532	653	-	-	960	-
Stage 1	841	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	529	653	-	-	960	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	743	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	10.5		0		0.1	
HCM LOS	10.5 B		0		0.1	
TIOM LOO	٥					
Minor Lane/Major Mvn	nt	NBT	NBRV	VBLn1	SBL	SBT
Capacity (veh/h)		-	-	653	960	-
HCM Lane V/C Ratio		-	-	0.005		-
HCM Control Delay (s)		-	-	10.5	8.8	0
HCM Lane LOS		-	-	В	Α	Α

HCM 95th %tile Q(veh) - - 0 0 -

	*	*	<b>†</b>	1	-	<b>↓</b>
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	<b>†</b>	7	ች	<b>†</b>
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	0.7	0.1	Lag	Lag	Lead	0.1
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	140110	WILL
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	0.10	0.10	0.49	0.49	0.74	0.73
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	20.5 C	13.4 B	10.0 B	4.3 A	Α.1	4.7 A
Approach Delay	19.8	Б	8.7	A	A	5.8
Approach LOS	19.0 B		Α.			3.6 A
Queue Length 50th (m)	1.8	0.0	28.2	0.0	10.8	3.3
	6.8	4.9	63.2	20.4	26.4	10.1
Queue Length 95th (m) Internal Link Dist (m)	73.5	4.9	75.1	20.4	20.4	162.3
Turn Bay Length (m)	13.5		75.1	130.0	150.0	102.3
Base Capacity (vph)	543	445	850	984	1008	1478
	543	445	850	984	1008	14/8
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn Reduced v/c Ratio	0.03	0.04		0.56		0.06
Reduced V/C Rallo	0.03	0.04	0.38	0.00	0.25	0.06
Intersection Summary						
Cycle Length: 99.5						
Actuated Cycle Length: 63.9						

Actuated Cycle Length: 63.9	Intersection Summary
	Cycle Length: 99.5
Natural Cycle: 70	Actuated Cycle Length: 63.9
Natural Cycle. 10	Natural Cycle: 70
Control Type: Actuated-Uncoordinated	Control Type: Actuated-Uncoordinated

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			4	1	
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	-
Grade. %	0			0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	100	2	2	3	3	100
Mymt Flow	7	0	0	351	363	6
WWW.CTIOW	- '	U	U	001	000	U
	/linor2		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			- :	- :	
Stage 2	333					
Approach	EB		NB		SB	
HCM Control Delay, s	18.1		0		0	
HCM LOS	С					
Minor Lane/Major Mvmt		NBL	NDT	EBLn1	SBT	SBR
	l .	1190		281	- 301	ODK -
Capacity (veh/h)			-			
HCM Lane V/C Ratio		-	-	0.025	-	-
HCM Control Delay (s)		0	-		-	-
HCM Lane LOS HCM 95th %tile Q(veh)		A 0	-	0.1	-	-

#### Lanes, Volumes, Timings 13: Leikin & RCMP

Future Total 2026AM Peak Hour 50 Leikin Dr

Maximum v/c Ratio: 0.56 Intersection Signal Delay: 8.2
Intersection Capacity Utilization 63.3%
Analysis Period (min) 15 Intersection LOS: A ICU Level of Service B Splits and Phases: 13: Leikin & RCMP V<sub>Ø1</sub> Ø6

05-16-2023 JK CGH Transportation Page 21 Lanes, Volumes, Timings 1: Merivale & Leikin

Future Total 2026PM Peak Hour 50 Leikin Dr

	•	*	4	<b>†</b>	ļ	4		
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3	l
Lane Configurations	*	7	ሻ	<b>†</b>	<b>†</b>	7		Ī
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	В	В	В	В	Α		
Approach Delay	39.1			10.8	9.8			
Approach LOS	D			В	Α			
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		
	0.00	0.00	0.00	0.20	00	0.20		

Intersection Summary

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

05-16-2023 JK CGH Transportation Page 1

### Lanes, Volumes, Timings 1: Merivale & Leikin

### Future Total 2026PM Peak Hour 50 Leikin Dr

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

Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin



05-16-2023 CGH Transportation JK Page 2

HCM 2010 TWSC 3: Merivale & Beckstead

HCM Control Delay (s)

HCM 95th %tile Q(veh)

HCM Lane LOS

Future Total 2026PM Peak Hour 50 Leikin Dr

Intersection							
Int Delay, s/veh	2.7						
		EDE	ND:	NDT	007	000	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	Ţ	7	7	<b>↑</b>	<b>^}</b>	^	
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	- 40	None	-	None	
Storage Length	0	8	40	-	-	-	
Veh in Median Storage		-	-	0	0	-	
Grade, %	100	100	100	100	100	100	
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	13.2 B		1.4		U		
I IOWI LOG	ь						
Minor Lane/Major Mvm	nt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)		1097	-	327	598	-	-
HCM Lane V/C Ratio		0.046	-	0.021		-	-
LICM Control Dolov (a)		0.4		16.2	12.1		

8.4 - 16.3 13.1 - -

0.1 - 0.1 1

- C B - -

tersection												
Delay, s/veh	5.2											
•				14/07	14/00				0.01		000	
ement	EBL		BR WBL		WBR	NBL		NBK	SBL		SBR	
Configurations		1>	ሻ	Þ			4			4		
Vol, veh/h	67	61	0 0	378	187	0	1	0	43	0	200	
ure Vol, veh/h	67	61	0 0	378	187	0	1	0	43	0	200	
flicting Peds, #/hr	1	0	10 10	0	1	1	0	0	0	0	1	
Control	Free	Free Fr	ee Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
Channelized	-	- No	ne -	-	None	-	-	None	-	-	None	
orage Length	30	-		-	-	-	-	-	-	-	-	
in Median Storag	e,# -	0		0	-	-	0	-	-	0	-	
de, %	-	0		0	-	-	0	-	-	0	-	
k Hour Factor	100	100 1	00 100	100	100	100	100	100	100	100	100	
vy Vehicles, %	2	13	2 2	2	4	2	2	2	2	2	2	
t Flow	67	61	0 0	378	187	0	1	0	43	0	200	
	01	O I	0	010	101	J		- 0	-10	- 0	200	
or/Minor	Major1		Major2		M	/linor1			Minor2			
onflicting 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	-	
ical Hdwv	4.12	-	- 4.12		-			6.22	7.12		6.22	
ical Hdwy Stg 1	-	-		-		6.12	5.52	-			-	
ritical Hdwy Stg 2	-			-		6.12		-			-	
ow-up Hdwy	2.218		- 2.218						3.518			
t Cap-1 Maneuver		-	- 1529				331	991	371	374	590	
Stage 1	1000	_	1020			797	732	-		558	-	
Stage 2						505	507	-		732		
Platoon blocked. %	-					303	307		000	132		
ov Cap-1 Maneuver	1005		- 1517			195	306	983	351	346	589	
ov Cap-1 Maneuver	1005		- 1017	-	-	195	306	903		346	209	
Stage 1	_	-		-	-		678			557	-	
		-				333	506					
Stage 2	-	-		-	-	333	200	-	101	678	-	
oproach	EB		WB			NB			SB			
CM Control Delay, s			0			16.8			17.6			
CM LOS	4.0		-			C			C			
200						J						
linor Lane/Major Mvr	mt N				WBL	WBT						
Capacity (veh/h)		306 10		-	1517	-		526				
HCM Lane V/C Ratio		0.003 0.0	67 -	-	-	-	-	0.462				
HCM Control Delay (s	s)	16.8	3.8 -	-	0	-	-	17.6				
HCM Lane LOS	,	С	Α -	-	Α	-	-	С				
110140511 0/11 0/ 1					0			0.4				

	41			
Inte	rsecti	ion S	IIIm	mar

Cycle Length: 120

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

Natural Cycle: 90

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HCM 95th %tile Q(veh)

0 0.2 - - 0 - - 2.4

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#### 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 LOS: C
ICU Level of Service D Intersection Signal Delay: 28.8 Intersection Capacity Utilization 74.6% 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

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05-16-2023 CGH Transportation Page 9 HCM 2010 TWSC 6: Bill Leathem & Site Access

HCM 95th %tile Q(veh)

Future Total 2026PM Peak Hour 50 Leikin Dr

Interpolice						
Intersection	0.0					
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		₽			4
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 Storag	je,# 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mymt 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		-	-	-	-	-
Stage 1	653	-	_	-	_	_
Stage 2	794		-	-	-	-
- mg						
Approach	WB		NB		SB	
HCM Control Delay, s			0		0.2	
HCM LOS	В					
Minor Lane/Major Mvi	mt	NBT	NRRV	VBLn1	SBL	SBT
Capacity (veh/h)		-	-	535	1124	-
HCM Lane V/C Ratio					0.005	
HCM Control Delay (s	:)			12.3	8.2	0
HCM Lane LOS	9)			12.3 B	0.2 A	A
HOM Carle LOS		-	-	0.0	A	А

- - 0.3 0 -

50 Leikin Dr

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		414	ĵ.		W	
Traffic Vol, veh/h	4	100	551	8	38	14
Future Vol, veh/h	4	100	551	8	38	14
Conflicting Peds, #/h	r 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 Storag	ge,# -	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	- 1	Major2	N	Minor2	
						EEE
Conflicting Flow All	559	0	-	0	613	555
Stage 1	-	-		-	555	-
Stage 2	4.42		-		58	C 00

Major/Minor	Major1	Ma	ajor2		Minor2		
Conflicting Flow All	559	0	-	0	613	555	
Stage 1	-	-	-	-	555	-	
Stage 2	-	-	-	-	58	-	
Critical Hdwy	4.13	-	-	-	6.63	6.23	
Critical Hdwy Stg 1	-	-	-	-	5.43	-	
Critical Hdwy Stg 2	-	-	-	-	5.83	-	
Follow-up Hdwy	2.219	-	-	-	3.519		
Pot Cap-1 Maneuver	1010	-	-	-		530	
Stage 1	-	-	-	-	574	-	
Stage 2	-	-	-	-	958	-	
Platoon blocked, %		-	-	-			
Mov Cap-1 Maneuver		-	-	-	438	530	
Mov Cap-2 Maneuver	-	-	-	-	438	-	
Stage 1	-	-	-	-	572	-	
Stage 2	-	-	-	-	958	-	
Approach	EB		WB		SB		
HCM Control Delay, s	0.3		0		13.8		
HCM LOS					В		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR SI	3Ln1
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	Α	Α	-	-	В
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection							
Int Delay, s/veh	1.3						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	Ì
Lane Configurations	*	7	ĵ.			<b></b>	
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	-		
Storage Length	0	8	-	-	30	-	
Veh in Median Storage	-	-	0		-	0	
Grade. %	0		0			0	
Peak Hour Factor	100	100	100	100	100	100	
Heavy Vehicles, %	2	2	8	2	2	9	
Mymt Flow	46	6	260	133	29	233	
WWITH FIOW	40	0	200	133	29	233	
Major/Minor	Minor1	1	Major1	- 1	Major2		
Conflicting Flow All	618	327	0	0	393	0	
Stage 1	327	-	-	-	-	-	
Stage 2	291	-	-	-	-	-	
Critical Hdwv	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, %	100						
Mov Cap-1 Maneuver	442	714			1166		
Mov Cap-1 Maneuver	442	- / 14	-		-		
Stage 1	731						
Stage 2	740		- 1	- 1	- 1	- :	
Staye 2	740						
Approach	WB		NB		SB		
HCM Control Delay, s	13.6		0		0.9		
HCM LOS	В						
Minor Lane/Major Mvn	nt	NBT	MRDI	NBLn1V	VRI n2	SBL	
	iit.	IND I					
Capacity (veh/h)			-	442	714	1166	
HCM Lane V/C Ratio		-	-	0.104			
HCM Control Delay (s)	)	-	-	14.1	10.1	8.2	
HCM Lane LOS		-	-	В	В	Α	
HCM 95th %tile Q(veh	1)	-	-	0.3	0	0.1	

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		1		UDL	4
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	e, # 0	-	0	-	-	0
Grade, %	0	-	0		-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	100	2	100	100	2
Mymt Flow	0	5	459	4	7	235
Major/Minor	Minor1	, and	Anior1		Anior?	
			Major1		Major2	
Conflicting Flow All	710	461	0	0	463	0
Stage 1	461	-	-	-		
Stage 2	249	- 7.0	-	-		-
Critical Hdwy	6.42	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	400	441	-	-	731	-
Stage 1	635	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %	00-		-	-	=0:	-
Mov Cap-1 Maneuver	396	441	-	-	731	-
Mov Cap-2 Maneuver	396	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	783	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	13.3		0		0.3	
HCM LOS	В		- 0		0.0	
	٥					
				···	0.01	
Minor Lane/Major Mvm	nt	NBT		VBLn1	SBL	SBT
Capacity (veh/h)		-	-	441	731	-
HCM Lane V/C Ratio		-		0.011	0.01	-
HCM Control Delay (s)		-	-	13.3	10	0
HCM Lane LOS		-	-	В	Α	Α

-						
Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			ની	₽	
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
Mymt Flow	13	0	0	380	268	11
	.0		·	000	200	
	Minor2		Major1		/lajor2	
Conflicting Flow All	654	274	279	0	-	0
Stage 1	274	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	7.4	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	310	765	1284	-	-	-
Stage 1	592	-	-		-	
Stage 2	520		_	-	_	-
Platoon blocked. %	020					
Mov Cap-1 Maneuver	310	765	1284	_		
Mov Cap-1 Maneuver	310	705	1204			
Stage 1	592	-	-	-	-	-
	520		-			
Stage 2	520		-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	17.1		0		0	
HCM LOS	С					
		. I m				
Minor Lane/Major Mvm	t	NBL		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		Α	-	С	-	-
HCM 95th %tile Q(veh)		0	-	0.1	-	-

HCM 95th %tile Q(veh) - - 0 0 -

Lanes, Volumes, Timings 13: Leikin & RCMP

Future Total 2026PM Peak Hour 50 Leikin Dr

	•	*	1	1	-	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	<b></b>	7	*	<b></b>
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	0.1	0.1	Lag	Lag	Lead	0.4
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	NONE	IVIAX
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
( )	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	29.5	29.5	58.4	58.4	60.7	60.7
Act Effct Green (s)	0.29					
Actuated g/C Ratio	0.29	0.29	0.56	0.56	0.59	0.59
v/c Ratio		0.44	0.13	0.01	0.01	-
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	Α	В	Α	В	В
Approach Delay	35.7		13.2			11.7
Approach LOS	D		В			В
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 Cummens						

#### Intersection Summary

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

05-16-2023 JK CGH Transportation Page 20 Lanes, Volumes, Timings 13: Leikin & RCMP

Future Total 2026PM Peak Hour 50 Leikin Dr

Maximum v/c Ratio: 0.86 Intersection Signal Delay: 27.5 Intersection LOS: C Intersection Capacity Utilization 55.7% ICU
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles. ICU Level of Service B

Splits and Phases: 13: Leikin & RCMP †ø₂ ø<sub>6</sub>

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#### **MOVEMENT SUMMARY**

♥ Site: 101 [Longfields-Bill Leathern 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

Vehic	cle Mo	ovement	Perfo	rma	nce										
Mov ID	Turn	Mov Class	[ Total	lows HV]		rival lows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% B: Que [ Veh. veh		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver Speed km/h
South	: Bill L	eathem													
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
Appro	ach		190	5.0	190	5.0	0.113	7.4	LOSA	0.6	4.4	0.03	0.59	0.03	48.8
East:	Site A	ccess E													
4	L2	All MCs	76	2.0	76	2.0	0.097	0.9	LOSA	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
Appro	ach		119	2.0	119	2.0	0.097	0.9	LOSA	0.5	3.4	0.34	0.18	0.34	36.6
North	Site A	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	LOSA	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
Appro	ach		120	2.0	120	2.0	0.107	1.5	LOSA	0.6	3.9	0.44	0.28	0.44	42.1
West:	Longf	ields													
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
Appro	ach		300	6.0	300	6.0	0.239	5.5	LOSA	1.4	10.2	0.36	0.51	0.36	52.6
All Ve	hicles		729	4.4	729	4.4	0.239	4.6	LOSA	1.4	10.2	0.28	0.44	0.28	47.8

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

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

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

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\JohnKingsley\CGH TRANSPORTATION\CGH Working - Documents\Projects\2022-162 Colliers 50 Leikin\DATA\sidra
\(\text{2022-162 SO Leikin 2023 03 10.sip}\)

#### **MOVEMENT SUMMARY**

♥ Site: 101 [Longfields-Bill Leathern 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

Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95%	Back Of	Prop.	Eff.	Aver.	Aver.
		Class	FI	lows	F	lows	Satn	Delay	Service	Q		Que	Stop		Speed
			[ Total   veh/h			HV]	v/c	sec		[ Veh. veh	Dist ] m		Rate	Cycles	km/h
South	: Bill L	eathem													
1	L2	All MCs	312	3.0	312	3.0	0.183	7.4	LOSA	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	LOSA	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	LOSA	1.0	7.5	0.03	0.59	0.03	36.1
Appro	ach		314	3.0	314	3.0	0.183	7.4	LOSA	1.0	7.5	0.03	0.59	0.03	49.2
East:	Site A	ccess E													
4	L2	All MCs	77	2.0	77	2.0	0.107	1.5	LOSA	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	LOSA	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	LOSA	0.5	3.8	0.44	0.27	0.44	19.0
Appro	ach		120	2.0	120	2.0	0.107	1.5	LOSA	0.5	3.8	0.44	0.27	0.44	36.4
North:	Site A	Access N													
7	L2	All MCs	1	2.0	1	2.0	0.117	2.1	LOSA	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	LOSA	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	LOSA	0.6	4.4	0.53	0.36	0.53	47.1
Appro	ach		120	2.0	120	2.0	0.117	2.1	LOSA	0.6	4.4	0.53	0.36	0.53	41.8
West:	Longf	ields													
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	LOSA	0.7	5.7	0.34	0.51	0.34	52.7
Appro	ach		168	9.9	168	9.9	0.140	5.5	LOSA	0.7	5.7	0.34	0.51	0.34	52.6
All Ve	hicles		722	4.3	722	4.3	0.183	5.1	LOSA	1.0	7.5	0.25	0.48	0.25	47.1

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

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

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

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2023 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: CGH TRANSPORTATION | Licence: NETWORK / FLOATING | Processed: June 12, 2023 12:28:31 PM
Project: C:\Users\JohnKings\JohnKi

# 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

	•	*	1	<b>†</b>	Į.	1		
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3	
Lane Configurations	*	7	ሻ	<b></b>	1	7		
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		Ī
Detector Phase	4	4	2	2	6	6		
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	6.0	
Minimum Split (s)	22.1	22.1	16.5	16.5	34.5	34.5	8.0	
Total Split (s)	30.1	30.1	66.5	66.5	66.5	66.5	8.0	
Total Split (%)	28.8%	28.8%	63.6%	63.6%	63.6%	63.6%	8%	
Maximum Green (s)	25.0	25.0	60.0	60.0	60.0	60.0	6.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	4.6	2.0	
All-Red Time (s)	1.8	1.8	1.9	1.9	1.9	1.9	0.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.1	5.1	6.5	6.5	6.5	6.5		
Lead/Lag	Lag	Lag					Lead	
Lead-Lag Optimize?	Yes	Yes					Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	Max	Max	Max	Max	None	
Walk Time (s)	7.0	7.0			7.0	7.0	3.0	
Flash Dont Walk (s)	10.0	10.0			21.0	21.0	0.0	
Pedestrian Calls (#/hr)	0	0			0	0	4	
Act Effct Green (s)	25.0	25.0	60.1	60.1	60.1	60.1		
Actuated g/C Ratio	0.25	0.25	0.61	0.61	0.61	0.61		
v/c Ratio	1.01	0.03	0.01	0.33	0.08	0.26		
Control Delay	85.2	17.1	8.8	10.8	8.7	1.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	85.2	17.1	8.8	10.8	8.7	1.9		
LOS	F	В	Α	В	Α	Α		
Approach Delay	84.1			10.8	3.4			
Approach LOS	F			В	Α			
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								

Intersection Summary

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

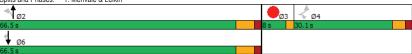
05-16-2023 JK **CGH Transportation** Page 1 Lanes, Volumes, Timings 1: Merivale & Leikin

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
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles. ICU Level of Service A

Splits and Phases: 1: Merivale & Leikin



05-16-2023 CGH Transportation JK Page 2

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T T	T T	NOL.	<u> </u>	13	ODIN
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	443	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -	None	riee -	None	riee -	None
Storage Length	0	None 8	40	None -		None -
	-	0	40			
Veh in Median Storage	e, # 0 0			0	0	-
Grade, %	100	400	400	-	-	400
Peak Hour Factor		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	N	Major2	
Conflicting Flow All	855	182	182	0	-	0
Stage 1	182	-	-	-	-	-
Stage 2	673			-		-
Critical Hdwy	6.42	6.22	4.12	-		_
Critical Hdwy Stg 1	5.42	0.22	7.12	-		-
Critical Hdwy Stg 2	5.42	_		-		_
Follow-up Hdwy		3.318	2 218			
Pot Cap-1 Maneuver	329	861	1393			
Stage 1	849	- 001	1000	- :		- 1
	507					
Stage 2	507	-	-	-	-	-
Platoon blocked, %	000	004	4000	-	-	-
Mov Cap-1 Maneuver		861	1393	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	507	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s			1.6		0	
HCM LOS	B		1.0		v	
TIOM EGG						
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1 E	EBLn2	SBT
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		Α	-	С	Α	-
HCM 95th %tile Q(veh	1)	0.3	-	0.1	0.2	-
	•					

Intersection													
t Delay, s/veh	32.6												
lovement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	ሻ	ĵ.		- 19	1>			4			4		
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	0.0	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	-	1100	None	1100	-	None	- Olop	Olop -	None	Olop -	- Otop	None	
Storage Length	30	- 1	INUITE			INOHE	- 1	-	INOHE	-	- 1	INUITE	
eh in Median Storage		0			0			0			0		
Grade. %	, # -	0	- 1		0	- 1	- 1	0	- 1		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	
Nymt Flow	160	575	4	7	29	39	1	2	25 4	213	3	65	
/IVMt Flow	100	5/5	4	- 1	29	39	1	2	4	213	3	65	
Major/Minor N	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	68	0	0	584	0	0	999	984	582	963	967	49	
Stage 1	-	-	-	-	-	-	902	902	-	63	63	-	
Stage 2	-	-	-	-	-	-	97	82		900	904	-	
Critical Hdwy	4.13	-	-	4.39	-	-	7.12	6.52	6.45	7.12	6.83	6.22	
Critical Hdwy Stg 1	-	-		-	-		6.12	5.52	-	6.12	5.83	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52		6.12	5.83	_	
ollow-up Hdwy	2.227	-	-	2.461		-	3.518	4.018	3.525	3.518	4.297	3.318	
Pot Cap-1 Maneuver	1527	-	-	870	-	-	222	248	472	235	226	1020	
Stage 1		-	-	-		-	332	356		948	785	-	
Stage 2		_	-	_		-	910	827		333	317	_	
Platoon blocked, %		-	-		-		0.10	021		000	011		
Mov Cap-1 Maneuver	1527	-		867			187	219	470	~ 212	200	1020	
Mov Cap-2 Maneuver	.02.			-			187	219		~ 212	200	-	
Stage 1	-	-		-			296	317		848	779	-	
Stage 2							842	820		294	282	-	
Olugo L							012	020		201	202		
Approach	EB			WB			NB			SB			
HCM Control Delay, s	1.7			0.9			17.1			122.6			
HCM LOS							С			F			
Minor Lane/Major Mvm	t	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	Α.			A			F				
HCM 95th %tile Q(veh)	1	0.1	0.3		_	0	_		11.7				
		0.1	0.0			0			11.7				
otes													
: Volume exceeds cap	acity	\$: De	elay exc	eeds 30	00s	+: Com	putation	Not De	efined	*: All	major v	olume i	n platoor

Lanes, Volumes, Timings 5: Prince of Wales & Merivale Future Total 2031AM Peak Hour 50 Leikin Dr

	•	*	1	<b>†</b>	. ↓	
Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations	*	7	*	<u></u>	<b>†</b> 19	
Traffic Volume (vph)	10	130	469	994	259	
Future Volume (vph)	10	130	469	994	259	
Lane Group Flow (vph)	10	130	469	994	297	
Turn Type	Perm	pm+ov	pm+pt	NA	NA	
Protected Phases		5	5	2	6	3
Permitted Phases	4	4	2			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	10.0	5.0	5.0	10.0	10.0	1.0
Minimum Split (s)	22.8	11.4	11.4	16.5	32.5	5.0
Total Split (s)	23.0	22.0	22.0	72.0	50.0	5.0
Total Split (%)	23.0%	22.0%	22.0%	72.0%	50.0%	5%
Maximum Green (s)	16.2	15.6	15.6	65.5	43.5	3.0
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	2.0
All-Red Time (s)	2.2	1.8	1.8	1.9	1.9	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.4	6.4	6.5	6.5	
Lead/Lag	Lag	Lead	Lead		Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Walk Time (s)	2.0				7.0	3.0
Flash Dont Walk (s)	14.0				19.0	0.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	10.0	12.6	90.2	95.3	74.5	
Actuated g/C Ratio	0.10	0.13	0.90	0.95	0.74	
v/c Ratio	0.06	0.47	0.53	0.60	0.13	
Control Delay	41.8	10.8	3.7	3.9	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.8	10.8	3.7	3.9	5.6	
LOS	D	В	Α	A	A	
Approach Delay	13.1			3.8	5.6	
Approach LOS	В			Α	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		100.0	333.0	741.3	
Turn Bay Length (m)	135.0	205	120.0	4004	0004	
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		
Reduced v/c Ratio	0.04	0.36	0.50	0.60	0.13	
Intersection Summary						

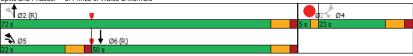
#### Intersection Summary

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

05-16-2023 JK **CGH Transportation** Page 8 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 Capacity Utilization 74.6% Analysis Period (min) 15 Intersection LOS: A ICU Level of Service D

Splits and Phases: 5: Prince of Wales & Merivale



05-16-2023 CGH Transportation JK Page 9

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		1>			4
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
Grade, %	0		0			0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	8	2	2	2
Mymt Flow	9	17	175	9	26	272
IVIVIIIL I IOW	3	- 17	113	3	20	212
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	-	-	-	-	-
Jg5 _						
Annragah	WB		ND		CD	
Approach			NB		SB	
HCM Control Delay, s	10.3		0		0.7	
HCM LOS	В					
Minor Lane/Major Mvm	nt	NBT	NBR\	NBLn1	SBL	SBT
Capacity (veh/h)			-	700	1391	-
HCM Lane V/C Ratio		-	-	0.037		
HOM Carded Delevide				40.0		0

Intersection						
Int Delay, s/veh	0.7					
	•	EDT	WDT	WDD	00:	000
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	4-	41	<b>♣</b>	0.1	₩	_
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
Storage Length	-	-	-	-	0	-
Veh in Median Storage	e,# -	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	Majau4		Aniano		Minano	
	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	
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	
5.0.g0 Z					300	
Approach	EB		WB		SB	
HCM Control Delay, s	0.3		0		11.6	
HCM LOS					В	
Minor Lane/Major Mvn	nt	EBL	EBT	WBT	WRP	SBLn1
	it.	1492	EDI	1101	WDR	580
Capacity (veh/h)				-		
HCM Lane V/C Ratio		0.011	- 0.4	-		0.055
HCM Control Delay (s)	)	7.4	0.1	-	-	11.6
HCM Lane LOS		Α	Α	-	-	В
HCM 95th %tile Q(veh	)	0	-	-	-	0.2

- - 10.3 7.6 0 - - B A A - - 0.1 0.1 -

HCM Control Delay (s)
HCM Lane LOS
HCM 95th %tile Q(veh)

50 Leikin Dr

Intersection	0.0						
Int Delay, s/veh	2.8						
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	75	7	ĵ,		*	<b>A</b>	
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	e,# 0	-	0	-	-	0	
Grade, %	0	-	0			0	
Peak Hour Factor	100	100	100	100	100	100	
Heavy Vehicles, %	2	2	6	2	2	6	
Mymt Flow	113	4	330	29	29	257	
	h.e. 4						
	Minor1		Major1		Major2		
Conflicting Flow All	660	345	0	0	359	0	
Stage 1	345	-	-	-	-	-	
Stage 2	315	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518		-	-	2.218	-	
Pot Cap-1 Maneuver	428	698	-	-	1200	-	
Stage 1	717	-	-	-	-	-	
Stage 2	740	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	418	698	-	-	1200	-	
Mov Cap-2 Maneuver	418	-	-	-	-	-	
Stage 1	717	-	-	-	-	-	
Stage 2	722	-	-	-	-	-	
Approach	WB		NB		SB		
HCM Control Delay, s	16.6		0		0.8		
HCM LOS	10.0		U		0.0		
TIOM EGG							
Minor Lane/Major Mvn	nt	NBT	NBRV	VBLn1V		SBL	
Capacity (veh/h)		-	-	418	698	1200	
HCM Lane V/C Ratio		-	-		0.006		
HCM Control Delay (s)	)	-	-	16.8	10.2	8.1	
HCM Lane LOS		-	-	С	В	Α	
HCM 95th %tile Q(veh	1)	-	-	1.1	0	0.1	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		₽			4
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	e, # 0	-	0	-	-	0
Grade, %	0		0			0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	100	6	100	100	2
Mymt Flow	0	3	190	2	4	298
IVIVIIIL I IUW	U	3	190		4	290
Major/Minor	Minor1	N	/lajor1		Major2	
Conflicting Flow All	497	191	0	0	192	0
Stage 1	191	-	-	-	-	-
Stage 2	306		-			
Critical Hdwy	6.42	7.2	-		5.1	-
Critical Hdwy Stg 1	5.42	- 1.2			-	
Critical Hdwy Stg 2	5.42				_	_
Follow-up Hdwy	3.518	4.2			3.1	
Pot Cap-1 Maneuver	532	653			960	
Stage 1	841	- 000			900	
			-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %	=0.7	0.00	-	-	00-	-
Mov Cap-1 Maneuver	529	653	-	-	960	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	743	-	-	-	-	-
Anneach	WB		NB		SB	
Approach						
HCM Control Delay, s	10.5		0		0.1	
HCM LOS	В					
Minor Lane/Major Mvn	nt	NBT	NBRV	WBLn1	SBL	SBT
Capacity (veh/h)		-	INDIK	653	960	-
HCM Lane V/C Ratio				0.005		
	١				8.8	-
HCM Control Delay (s	)	-	-	10.5		0
HCM Lane LOS		-	-	В	A	Α
HCM 95th %tile Q(veh	1)	-	-	0	0	-

Intersection   Int Delay, s/veh   0.2
Int Delay, s/veh
Lane Configurations
Lane Configurations         Y         ↓         ↓           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         0         -         0         0         -         0         0         0         0         0         0
Traffic Vol, veh/h         7         0         0         351         363         6           Future Vol, veh/h         7         0         0         351         363         6           Conflicting Peds, #/hr         0         None         None         Storage Length         0         -         -         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         0         0         -         0         0         -         -         0         0         -         0         0         0         -         0         0         0         0         0         0         0         0         0         0
Future Vol, veh/h         7         0         0         351         363         6           Conflicting Peds, #/hr         0         None         <
Conflicting Peds, #/hr         0         None         Non
Sign Control         Stop         Stop         Free         Ree         None         None           Stade 1         366         369         0         0         -         0         0         -         0         0         -         -         0         0         -         0         0         -         0
RT Channelized         - None         - None         - None         - None           Storage Length         0         0         0            Veh in Median Storage, # 0         0         0            Grade, % 0         0 0         0         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         Month of the contraction of the
Storage Length         0         -         0         0         -         -         -         0         0         -         -         0         0         -         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         0         0         -         -         0         0         -         0         0         351         363         6           Major/Minor         Minor         2         Major         1         Major         2         2         3         3         100         0         3         5         -         -         -         0         0         3         5         -         -         -         0         0
Weh in Median Storage, #         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         351         363         6         6           Major/Minor         Minor2         Major1         Major2         Conflicting Flow All         717         366         369         0         -         0         0         Stage 1         366         -
Grade, %         0         -         -         0         0         -         -         0         0         -         -         0         0         -         -         0         0         -         100
Peak Hour Factor         100
Heavy Vehicles, %         100         2         2         3         3         100           Mvmt Flow         7         0         0         351         363         6           Major/Minor         Minor2         Major1         Major2         Major2           Conflicting Flow All Stage 1         717         366         369         0         -         0         0           Stage 1         366         -
Mvmt Flow         7         0         0         351         363         6           Major/Minor         Minor2         Major1         Major2         Major2           Conflicting Flow All         717         366         369         0         -         0           Stage 1         366         -         -         -         -         -         -
Major/Minor         Minor2         Major1         Major2           Conflicting Flow All         717         366         369         0         -         0           Stage 1         366         -         -         -         -         -
Conflicting Flow All 717 366 369 0 - 0 Stage 1 366
Conflicting Flow All 717 366 369 0 - 0 Stage 1 366
Conflicting Flow All 717 366 369 0 - 0 Stage 1 366
Stage 1 366
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

	<b>*</b>	•	1	1	-	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	<b>*</b>	7	*	<b>*</b>
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	0.1	0.1	Lag	Lag	Lead	0.7
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	THORE	IVICIA
Flash Dont Walk (s)	11.0	11.0	7.0	7.0		
Pedestrian Calls (#/hr)	19	19	7.0	7.0		
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	0.16	0.16	0.49	0.49	0.74	0.79
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	20.5 C	13.4 B	16.0 B	4.3 A	0.1 A	4.7 A
	19.8	В	8.7	А	А	5.8
Approach Delay						
Approach LOS	B	0.0	A	0.0	40.0	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	400.0	450.0	162.3
Turn Bay Length (m)		44-	050	130.0	150.0	4.470
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
Interposition Cummons						

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 Signal Delay: 8.2 Intersection LOS: A Intersection Capacity Utilization 63.3% Analysis Period (min) 15 ICU Level of Service B Splits and Phases: 13: Leikin & RCMP V<sub>Ø1</sub> Ø6

05-16-2023 JK CGH Transportation Page 21 Lanes, Volumes, Timings 1: Merivale & Leikin

Future Total 2031PM Peak Hour 50 Leikin Dr

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	•	*	1	<b>†</b>	ļ	4		
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø3	
Lane Configurations	*	7	*	<b>†</b>	<b>†</b>	7		-
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	В	В	В	В	A		
Approach Delay	39.1			10.9	9.8			
Approach LOS	D			В	Α			
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		
	0.00	0.00	0.00	V 1	00	0.20		

Intersection Summary

JK

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

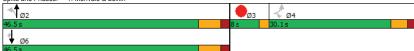
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#### Lanes, Volumes, Timings 1: Merivale & Leikin

### Future Total 2031PM Peak Hour 50 Leikin Dr

Maximum v/c Ratio: 0.80
Intersection Signal Delay: 18.7
Intersection LOS: B
Intersection Capacity Utilization 54.9%
ICU Level of Service A
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Leikin



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 CGH Transportation

 JK
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### Simulation Settings 1: Merivale & Leikin

Future Total 2031PM Peak Hour 50 Leikin Dr

	•	•	1	<b>†</b>	ļ	4
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	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+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				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Intersection Summary						

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-						
Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	*	7	ሻ	<b>A</b>	1	
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	e. # 0	-	-	0	0	-
Grade, %	0			0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	7	2	2
Mymt Flow	7	154	51	271	464	0
			-			-
	Minor2		Major1		Major2	
Conflicting Flow All	837	464	464	0	-	0
Stage 1	464	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy		3.318		-	-	-
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	-	-		-	-
J	,					
A	ED		ND		OD.	
Approach	EB		NB		SB	
HCM Control Delay, s	13.2		1.3		0	
HCM LOS	В					
Minor Lane/Major Mvm	nt	NBL	NBT	EBLn1 I	EBLn2	SBT
Capacity (veh/h)		1097	-	321	598	-
HCM Lane V/C Ratio		0.046		0.022		
HCM Control Delay (s)		8.4	-	16.5	13.1	-
HCM Lane LOS		A		C	В	
HCM 95th %tile Q(veh	)	0.1		0.1	1	-
0041 70410 0(1011	,	0.1		0.1	,	

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	1>		*	ĵ,			4			4	
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	7.0			0			C			C.C		
TIOM EGG										Ü		
Minor Lane/Major Mvm	nt	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			
0001 70010 3(1011	,	U	0.2			0			2.7			

Lanes, Volumes, Timings 5: Prince of Wales & Merivale Future Total 2031PM Peak Hour 50 Leikin Dr

	•	-	1	Ť	¥	
Lane Group	EBL	EBR	NBL	NBT	SBT	Ø3
Lane Configurations	ኝ	7	ች	<b>*</b>	<b>†</b> 15	
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	Е	Е	Α	Α	В	
Approach Delay	77.7			2.9	17.1	
Approach LOS	Е			Α	В	
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						

Intersection Summary

Cycle Length: 120

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

Natural Cycle: 90

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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 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



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	•	•	4	<b>†</b>	<b>↓</b>	1
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	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+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				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Intersection Summary						
intersection Cummary						

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WDL	וטוו	13ND1	ווטוו	ODL	4Î
Traffic Vol. veh/h	<b>ነ</b>	29	434	2	6	229
Future Vol. veh/h	14	29	434	2	6	229
Conflicting Peds, #/hr		29	434	0	0	229
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -		Free -		Free	None
Storage Length	0	None	- 1		- 1	None
	-		0	-		0
Veh in Median Storage	e,# 0 0	-	0	-	-	0
Grade, %	-	100	100	100	100	-
Peak Hour Factor	100	100		100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	29	434	2	6	229
Major/Minor	Minor1	N	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	0.22			4.12	
Critical Hdwy Stg 2	5.42					
Follow-up Hdwy	3.518				2.218	
Pot Cap-1 Maneuver	3.518	621	-		1124	-
Stage 1	653	021			1124	
	799	-				-
Stage 2	799	-	-	-	-	
Platoon blocked, %	110	004	-	_	1404	-
Mov Cap-1 Maneuver		621	-	-	1124	-
Mov Cap-2 Maneuver		-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s			0		0.2	
HCM Control Delay, s	12.3 B		U		0.2	
HOW LUS	В					
Minor Lane/Major Mvr	nt	NBT	NBRV	VBLn1	SBL	SBT
Capacity (veh/h)		-	-	535	1124	-
HCM Lane V/C Ratio			-		0.005	
HCM Control Delay (s	)	-	-	12.3	8.2	0
HCM Lane LOS	,			12.3 B	Ο.2	A
HCM 95th %tile Q(veh	n)			0.3	0	^
HOW SOUT WITH WIVE	1)			0.5	U	

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		414	ĵ.		W	ODIT
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
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storag	e,# -	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	l l	Minor2	
Conflicting Flow All	550	Λ	_	Λ	613	555

Major/Minor	Major1	Ma	jor2	1	Minor2		
Conflicting Flow All	559	0	-	0	613	555	
Stage 1	-	-	-	-	555	-	
Stage 2	-	-	-	-	58	-	
Critical Hdwy	4.13	-	-	-	6.63	6.23	
Critical Hdwy Stg 1	-	-	-	-	5.43	-	
Critical Hdwy Stg 2	-	-	-	-	5.83	-	
Follow-up Hdwy	2.219	-	-	-	3.519		
Pot Cap-1 Maneuver	1010	-	-	-	440	530	
Stage 1	-	-	-	-	574	-	
Stage 2	-	-	-	-	958	-	
Platoon blocked, %		-	-	-			
Mov Cap-1 Maneuver		-	-	-	438	530	
Mov Cap-2 Maneuver	-	-	-	-	438	-	
Stage 1	-	-	-	-	572	-	
Stage 2	-	-	-	-	958	-	
Approach	EB		WB		SB		
HCM Control Delay, s	0.3		0		13.8		
HCM LOS					В		

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	Α	Α	-	- B	
HCM 95th %tile Q(veh)	0	-	-	- 0.4	

latana atian						
Intersection	4.0					
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	ሻ	7	ĵ.		7	<b>†</b>
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
Storage Length	0	8	-	-	30	-
Veh in Median Storage		-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	8	2	2	9
Mvmt Flow	46	6	260	133	29	233
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	618	327	0	0	393	0
Stage 1	327	321	-	-	-	-
Stage 2	291					
Critical Hdwy	6.42	6.22			4.12	
Critical Hdwy Stg 1	5.42	-			7.12	
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	-	-	-	-	-
· ·						
Annroach	WB		NB		SB	
Approach						
HCM Control Delay, s HCM LOS	13.6 B		0		0.9	
HOW LUS	В					
Minor Lane/Major Mvm	nt	NBT	NBRV	WBLn1V	VBLn2	SBL
Capacity (veh/h)		-	-	442	714	1166
HCM Lane V/C Ratio		-	-	0.104		
HCM Control Doloy (a)				444	10.1	0.0

- - 14.1 10.1 8.2

- - B B A

- - 0.3 0 0.1

HCM 2010 TWSC

HCM Control Delay (s)

HCM 95th %tile Q(veh)

HCM Lane LOS

HCM 95th %tile Q(veh)

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR		NDR	OBL	- <del>2</del> 81
Traffic Vol, veh/h	<b>""</b>	5	<b>1</b> → 459	4	7	235
Future Vol. veh/h	0	5	459	4	7	235
Conflicting Peds, #/hr	0	0	459	0	0	235
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	Stop -	None	riee -	None	-	None
Storage Length	0	INOHE -		NOITE		NOTICE -
Veh in Median Storage			0			0
Grade, %	0		0			0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	100	2	100	100	2
	0	5				235
Mvmt Flow	U	5	459	4	7	235
Major/Minor	Minor1	1	Major1	N	Major2	
Conflicting Flow All	710	461	0	0	463	0
Stage 1	461	-	-	-	-	-
Stage 2	249	-	-	-	-	-
Critical Hdwy	6.42	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.42	-		-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	400	441	-	-	731	-
Stage 1	635	-		-	-	-
Stage 2	792	-		-		_
Platoon blocked, %	.02					-
Mov Cap-1 Maneuver	396	441		_	731	
Mov Cap-2 Maneuver				_	701	_
Stage 1	635					
Stage 2	783					_
Staye 2	103					
Approach	WB		NB		SB	
HCM Control Delay, s	13.3		0		0.3	
HCM LOS	В					
Minor Lane/Major Mvr	nt	NBT	NIDDI	WBLn1	SBL	SBT
	IIL		INDIN	441	731	
Capacity (veh/h)		-				-
HCM Cantrol Dalay (a	١	-		0.011	0.01	0
HCM Control Delay (s	)		-	13.3 B	Α	A
HCM Lane LOS		-	-	В	A	А

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
		EDR	INDL	IND I		ODK
Lane Configurations	***	^	٥		<b>1</b>	4.4
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	-
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	h	Major2	
Conflicting Flow All	654	274	279	0	-	0
Stage 1	274	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	7.4	6.22	4.12	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.318		-	-	-
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			-		
Olugo 2	020					
Approach	EB		NB		SB	
HCM Control Delay, s	17.1		0		0	
HCM LOS	С					
Minor Lane/Major Mvm	nt	NBL	NRT	EBLn1	SBT	SBR
Capacity (veh/h)		1284	-	310	-	- ODIK
HCM Lane V/C Ratio		1204		0.042	- 1	
HCM Control Delay (s)		0	_	17.1		
HCM Lane LOS		A		17.1	- 1	- 1
HOW LAITE LOS		А	-	U	-	-

0 - 0.1 - -

HCM 95th %tile Q(veh)

Lanes, Volumes, Timings 13: Leikin & RCMP

Future Total 2031PM Peak Hour 50 Leikin Dr

	•	*	<b>†</b>	1	-	Į.
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	*	7	<b>A</b>	7	*	<u> </u>
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	Α	В	Α	В	В
Approach Delay	35.7		13.2			11.7
Approach LOS	D		В			В
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						

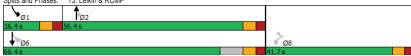
Cycle Length: 114.5
Actuated Cycle Length: 103.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

05-16-2023 JK CGH Transportation Page 30 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 LOS: C Intersection Capacity Utilization 55.7% ICU
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles. ICU Level of Service B Splits and Phases: 13: Leikin & RCMP



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### Simulation Settings 13: Leikin & RCMP

### Future Total 2031PM Peak Hour 50 Leikin Dr

	1	*	†	-	-	ļ
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	0		3.5
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	3.0		3.0			3.0
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	25	15		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	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+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			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Intersection Summary						

 05-16-2023
 CGH Transportation

 JK
 Page 32

#### **MOVEMENT SUMMARY**

♥ Site: 101 [Longfields-Bill Leathern 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

Vehic	cle Mo	ovement	Perfo	rma	nce										
Mov ID	Turn	Mov Class	[ Total	lows HV]		rival lows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% B: Que [ Veh. veh		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver Speed km/h
South	: Bill L	eathem													
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
Appro	ach		190	5.0	190	5.0	0.113	7.4	LOSA	0.6	4.4	0.03	0.59	0.03	48.8
East:	Site A	ccess E													
4	L2	All MCs	76	2.0	76	2.0	0.097	0.9	LOSA	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
Appro	ach		119	2.0	119	2.0	0.097	0.9	LOSA	0.5	3.4	0.34	0.18	0.34	36.6
North	Site A	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	LOSA	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
Appro	ach		120	2.0	120	2.0	0.107	1.5	LOSA	0.6	3.9	0.44	0.28	0.44	42.1
West:	Longf	ields													
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
Appro	ach		300	6.0	300	6.0	0.239	5.5	LOSA	1.4	10.2	0.36	0.51	0.36	52.6
All Ve	hicles		729	4.4	729	4.4	0.239	4.6	LOSA	1.4	10.2	0.28	0.44	0.28	47.8

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

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

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

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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\(\text{2022-162 SO Leikin 2023 03 10.sip}\)

#### **MOVEMENT SUMMARY**

♥ Site: 101 [Longfields-Bill Leathern 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

Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95%	Back Of	Prop.	Eff.	Aver.	Aver.
		Class	FI	lows	F	lows	Satn	Delay	Service	Q		Que	Stop		Speed
			[ Total   veh/h			HV]	v/c	sec		[ Veh. veh	Dist ] m		Rate	Cycles	km/h
South	: Bill L	eathem													
1	L2	All MCs	312	3.0	312	3.0	0.183	7.4	LOSA	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	LOSA	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	LOSA	1.0	7.5	0.03	0.59	0.03	36.1
Appro	ach		314	3.0	314	3.0	0.183	7.4	LOSA	1.0	7.5	0.03	0.59	0.03	49.2
East:	Site A	ccess E													
4	L2	All MCs	77	2.0	77	2.0	0.107	1.5	LOSA	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	LOSA	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	LOSA	0.5	3.8	0.44	0.27	0.44	19.0
Appro	ach		120	2.0	120	2.0	0.107	1.5	LOSA	0.5	3.8	0.44	0.27	0.44	36.4
North:	Site A	Access N													
7	L2	All MCs	1	2.0	1	2.0	0.117	2.1	LOSA	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	LOSA	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	LOSA	0.6	4.4	0.53	0.36	0.53	47.1
Appro	ach		120	2.0	120	2.0	0.117	2.1	LOSA	0.6	4.4	0.53	0.36	0.53	41.8
West:	Longf	ields													
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	LOSA	0.7	5.7	0.34	0.51	0.34	52.7
Appro	ach		168	9.9	168	9.9	0.140	5.5	LOSA	0.7	5.7	0.34	0.51	0.34	52.6
All Ve	hicles		722	4.3	722	4.3	0.183	5.1	LOSA	1.0	7.5	0.25	0.48	0.25	47.1

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

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

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

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Intersection												
Intersection Delay, s/veh	25.6											
Intersection LOS	25.0 D											
Intersection EOO	D											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	ĵ,		ሻ	ĵ,			4			4	
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			Α			Α			В		
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					
		7	160	579	7	68	281					
Lane Flow Rate Geometry Grp		2	7	7	7	7	2					
Geometry Grp Degree of Util (X)		0.012	7 0.27	7 0.894	7 0.014	7 0.121	0.459					
Geometry Grp Degree of Util (X) Departure Headway (Hd)		2 0.012 6.169	7 0.27 6.085	7 0.894 5.557	7 0.014 7.393	7 0.121 6.387	2 0.459 5.876					
Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, Y/N		2 0.012 6.169 Yes	7 0.27 6.085 Yes	7 0.894 5.557 Yes	7 0.014 7.393 Yes	7 0.121 6.387 Yes	2 0.459 5.876 Yes					
Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, Y/N Cap		2 0.012 6.169 Yes 579	7 0.27 6.085 Yes 592	7 0.894 5.557 Yes 654	7 0.014 7.393 Yes 484	7 0.121 6.387 Yes 561	2 0.459 5.876 Yes 613					
Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, Y/N Cap Service Time		2 0.012 6.169 Yes 579 4.218	7 0.27 6.085 Yes 592 3.807	7 0.894 5.557 Yes 654 3.28	7 0.014 7.393 Yes 484 5.134	7 0.121 6.387 Yes 561 4.128	2 0.459 5.876 Yes 613 3.907					
Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, Y/N Cap Service Time HCM Lane V/C Ratio		2 0.012 6.169 Yes 579 4.218 0.012	7 0.27 6.085 Yes 592 3.807 0.27	7 0.894 5.557 Yes 654 3.28 0.885	7 0.014 7.393 Yes 484 5.134 0.014	7 0.121 6.387 Yes 561 4.128 0.121	2 0.459 5.876 Yes 613 3.907 0.458					
Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, Y/N Cap Service Time HCM Lane V/C Ratio HCM Control Delay		2 0.012 6.169 Yes 579 4.218 0.012 9.3	7 0.27 6.085 Yes 592 3.807 0.27 11.1	7 0.894 5.557 Yes 654 3.28 0.885 37.5	7 0.014 7.393 Yes 484 5.134 0.014 10.2	7 0.121 6.387 Yes 561 4.128 0.121 10	2 0.459 5.876 Yes 613 3.907 0.458 13.8					
Geometry Grp Degree of Util (X) Departure Headway (Hd) Convergence, Y/N Cap Service Time HCM Lane V/C Ratio		2 0.012 6.169 Yes 579 4.218 0.012	7 0.27 6.085 Yes 592 3.807 0.27	7 0.894 5.557 Yes 654 3.28 0.885	7 0.014 7.393 Yes 484 5.134 0.014	7 0.121 6.387 Yes 561 4.128 0.121	2 0.459 5.876 Yes 613 3.907 0.458					

lata as a stir a												
Intersection Intersection Delay, s/veh	20.2											
Intersection LOS	20.2 C											
intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	*	<b>1</b> 2		ሻ	ĵ.			4			44	
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	(
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	Α			D				Α		В		
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					
Сар		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		Α	Α	Α	N	D	В					
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.	Project	50 Leikin Dr	_
Scenario	Existing/Future	Date	2023-06-23	
Comments				

SEGMENTS			Leikin Dr	Bill Leathem Dr	Leikin Dr	Bill Leathem Dr
SEGMENTS			Ex	Ex	Fut	Fut
	Sidewalk Width Boulevard Width		no sidewalk n/a	no sidewalk n/a	≥ 2 m 0.5 - 2 m	≥ 2 m < 0.5
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	> 3000	> 3000
Pedestrian	Operating Speed On-Street Parking		> 50 to 60 km/h no	> 50 to 60 km/h no	> 50 to 60 km/h no	> 50 to 60 km/h no
sti	Exposure to Traffic PLoS	F	F	F	D	E
ge	Effective Sidewalk Width					
Pe	Pedestrian Volume					
	Crowding PLoS		-	-	-	-
	Level of Service		F	F	-	-
	Type of Cycling Facility		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		С	D	С	D
Bicycle	Bike Lane (+ Parking Lane) Width		≥1.5 to <1.8 m		≥1.5 to <1.8 m	
Š	Bike Lane Width LoS	D	В	-	В	-
Bi	Bike Lane Blockages		Rare		Rare	
	Blockage LoS		Α	-	Α	-
	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		Α	Α	A	Α
	Level of Service		С	D	С	D
it	Facility Type					
Transit	Friction or Ratio Transit:Posted Speed	_				
Tra	Level of Service		-	-	-	-
	Truck Lane Width		> 3.7 m	> 3.7 m		
<del>Z</del>	Travel Lanes per Direction	В	1	1		
Truck	Level of Service	В	В	В	-	-

### **Multi-Modal Level of Service - Intersections Form**

Consultant Scenario Comments

GH Transportation Inc.	Project
kisting/Future	Date
	i

50 Leikin Dr 2023-02-23

	INTERSECTIONS		Merivale Rd	& Leikin Dr			Prince of Wales I	Or & Merivale	Rd
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
	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
Pedestrian	Right Turn Channel	No Right Turn	No Channel		No Channel	No Right Turn	No Channel		Smart Channel
st	Corner Radius	No Right Turn	5-10m		10-15m	No Right Turn	10-15m		15-25m
pede	Crosswalk Type	Std transverse markings	Std transverse markings		Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings		Std transverse markings
<u>.</u>	PETSI Score	68	82		-12	55	34		8
	Ped. Exposure to Traffic LoS	С	В	-	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	С	С	-	C	E	E	-	C
	Level of Service	С	С	•	F	E	<u> </u>	<u>-</u>	F
			F				F	·	
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
	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
<u>o</u>	Cyclist relative to RT motorists	F	-	-	Not Applicable	В	-	-	Not Applicable
yc.	Separated or Mixed Traffic	Mixed Traffic	-	-	Separated	Separated	Separated	-	Separated
Bicycle	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	-	С	•	Α .	-	A	-	Α
	Level of Service	F	C F		A	В	A B	-	A
			'						
#	Average Signal Delay								
Transit	Level of Service	-	-		<u> </u>	-	<u> </u>		
	Effective Corner Radius	> 15 m			> 15 m	> 15 m			10 - 15 m
Truck	Number of Receiving Lanes on Departure from Intersection	≥2			1	1			≥2
臣		Α	-	-	С	С	-	-	В
	Level of Service		(				C		
0	Volume to Capacity Ratio		0.0 -	0.60			0.71 -	0.80	
Auto	Level of Service		-	<b>1</b>			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: Non-residential developments	Check if proposed & add descriptions
	1.	TDM PROGRAM MANAGEMENT	
	1.1	Program coordinator	
BASIC	1.1.1	Designate an internal coordinator, or contract with an external coordinator	
	1.2	Travel surveys	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	
	2.	WALKING AND CYCLING	
	2.1	Information on walking/cycling routes & destin	ations
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	Ø
	2.2	Bicycle skills training	
		Commuter travel	
BETTER 1	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	
	2.3	Valet bike parking	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	

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

Check if proposed & TDM measures: Non-residential developments add descriptions 4. RIDESHARING 4.1 Ridematching service Commuter travel ★ 4.1.1 Provide a dedicated ridematching portal at OttawaRideMatch.com 4.2 Carpool parking price incentives Commuter travel 4.2.1 Provide discounts on parking costs for registered BETTER carpools 4.3 Vanpool service Commuter travel BETTER 4.3.1 Provide a vanpooling service for long-distance commuters 5. CARSHARING & BIKESHARING 5.1 Bikeshare stations & memberships 5.1.1 Contract with provider to install on-site bikeshare station for use by commuters and visitors Commuter travel 5.1.2 Provide employees with bikeshare memberships for local business travel 5.2 Carshare vehicles & memberships Commuter travel 5.2.1 Contract with provider to install on-site carshare BETTER vehicles and promote their use by tenants 5.2.2 Provide employees with carshare memberships for BETTER local business travel PARKING 6.1 Priced parking Commuter travel

★ 6.1.1 Charge for long-term parking (daily, weekly, monthly)

6.1.2 Unbundle parking cost from lease rates at multi-tenant

Visitor travel

6.1.3 Charge for short-term parking (hourly)

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

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

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

provided)

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

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

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