

# 780 Baseline Road

## Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report

Prepared for:

Theberge Developments Ltd.  
1600 Laperriere Avenue, Suite 205  
Ottawa ON K1Z 8P5

Prepared by:



6 Plaza Court  
Ottawa, ON K2H 7W1

October 2022

PN: 2021-083

## Table of Contents

1	Screening .....	1
2	Existing and Planned Conditions .....	1
2.1	Proposed Development.....	1
2.2	Existing Conditions .....	3
2.2.1	Area Road Network .....	3
2.2.2	Existing Intersections.....	3
2.2.3	Existing Driveways .....	4
2.2.4	Cycling and Pedestrian Facilities.....	5
2.2.5	Existing Transit.....	8
2.2.6	Existing Area Traffic Management Measures.....	9
2.2.7	Existing Peak Hour Travel Demand.....	9
2.2.8	Collision Analysis .....	11
2.3	Planned Conditions.....	14
2.3.1	Changes to the Area Transportation Network .....	14
2.3.2	Other Study Area Developments.....	16
3	Study Area and Time Periods .....	16
3.1	Study Area .....	16
3.2	Time Periods .....	16
3.3	Horizon Years.....	16
4	Exemption Review .....	17
5	Development-Generated Travel Demand .....	17
5.1	Mode Shares.....	17
5.2	Trip Generation .....	18
5.3	Trip Distribution.....	19
5.4	Trip Assignment.....	19
6	Background Network Travel Demands.....	21
6.1	Transportation Network Plans .....	21
6.2	Background Growth.....	21
6.3	Other Developments .....	22
6.4	Trip Reductions from Existing Site Land Uses.....	22
7	Demand Rationalization .....	23
7.1	2034 Future Background Operations .....	23
7.2	Demand Rationalization Conclusions .....	26
8	Transportation Demand Management .....	26
8.1	Context for TDM .....	26
8.2	Need and Opportunity.....	26
8.3	TDM Program .....	26
9	Transit.....	27
9.1	Transit Priority .....	27
10	Network Intersection Design.....	27
10.1	Network Intersection Control.....	27
10.2	Network Intersection Design.....	27

10.2.1	2034 Future Total Operations .....	27
10.2.2	2034 Future Total Operations – Sensitivity Without Baseline Rapid Transit .....	29
10.2.3	Network Intersection MMLOS.....	32
10.2.4	Recommended Design Elements.....	32
11	Summary of Improvements Indicated and Modifications Options.....	32
12	Conclusion .....	35

## List of Figures

Figure 1:	Area Context Plan .....	1
Figure 2:	Concept Plan.....	2
Figure 3:	Existing Driveways .....	5
Figure 4:	Study Area Pedestrian Facilities .....	6
Figure 5:	Study Area Cycling Facilities .....	6
Figure 6:	Existing Pedestrian Volumes .....	7
Figure 7:	Existing Cyclist Volumes .....	7
Figure 8:	Existing Study Area Transit Service.....	8
Figure 9:	Existing Study Area Transit Stops .....	9
Figure 10:	Existing Traffic Counts .....	10
Figure 11:	Study Area Collision Records – Representation of 2015-2019.....	12
Figure 12:	Baseline Road Rapid Transit Corridor.....	15
Figure 13:	Prince of Wales Drive at Baseline Road/Heron Road.....	16
Figure 14:	New Site Generation Auto Volumes.....	20
Figure 15:	Pass-By Auto Volumes.....	21
Figure 16:	Trip Reduction Volumes .....	23
Figure 17:	2034 Future Background Volumes .....	24
Figure 18:	2034 Future Total Volumes .....	28
Figure 19:	2034 Future Total Volumes – Fisher Avenue at Baseline Road Without Baseline Rapid Transit.....	31

## Table of Tables

Table 1:	Intersection Count Date.....	9
Table 2:	Existing Intersection Operations.....	10
Table 3:	Study Area Collision Summary, 2015-2019 .....	12
Table 4:	Summary of Collision Locations, 2015-2019 .....	13
Table 5:	Fisher Avenue at Baseline Road Collision Summary.....	13
Table 6:	Baseline Road between Marson Street and Fisher Avenue Collision Summary.....	14
Table 7:	Fisher Avenue between McCooey Lane and Baseline Road Collision Summary .....	14
Table 8:	Exemption Review .....	17
Table 9:	TRANS Trip Generation Manual Recommended Mode Shares – Merivale .....	17
Table 10:	Proposed Development Mode Shares.....	18
Table 11:	Trip Generation Person Trip Rates .....	18
Table 12:	Total Person Trip Generation .....	18
Table 13:	Internal Capture Rates.....	18

Table 14: Trip Generation by Mode ..... 19

Table 15: OD Survey Distribution – Merivale ..... 19

Table 16: Trip Assignment ..... 20

Table 17: TRANS Regional Model Projections – Study Area Growth Rates..... 22

Table 18: Study Area Growth Rates Applied ..... 22

Table 19: Trip Generation Person Trip Rates by Peak Hour ..... 22

Table 20: Estimated Existing Auto Trip Volumes vs Forecasted Auto Trip Volumes..... 23

Table 21: 2034 Future Background Intersection Operations ..... 24

Table 22: Trip Generation by Transit Mode ..... 27

Table 23: Forecasted Site-Generated Transit Ridership..... 27

Table 24: 2034 Future Total Intersection Operations ..... 28

Table 25: Trip Generation by Mode – Without Baseline Rapid Transit..... 30

Table 26: Proposed Site Generation Vehicle Trip Volumes Without BRT vs Proposed Site Generation Vehicle Trip Volumes With BRT ..... 30

Table 27: 2034 Future Total Intersection Operations– Fisher Avenue at Baseline Road Without Baseline Rapid Transit..... 31

Table 28: Study Area Intersection MMLOS Analysis ..... 32

## List of Appendices

- Appendix A – TIA Screening Form and Certification Form
- Appendix B – Turning Movement Count Data
- Appendix C – Synchro Intersection Worksheets – Existing Conditions
- Appendix D – Collision Data
- Appendix E – TRANS Model Plots
- Appendix F – Background Development Volumes
- Appendix G – Existing Site Generated Trip
- Appendix H – Synchro Intersection Worksheets – 2034 Future Background Conditions
- Appendix I – TDM Checklist
- Appendix J – Synchro Intersection Worksheets – 2034 Future Total Conditions
- Appendix K – Synchro Worksheets – Fisher Avenue at Baseline Road Without Baseline Rapid Transit
- Appendix L – MMLOS Analysis

## 1 Screening

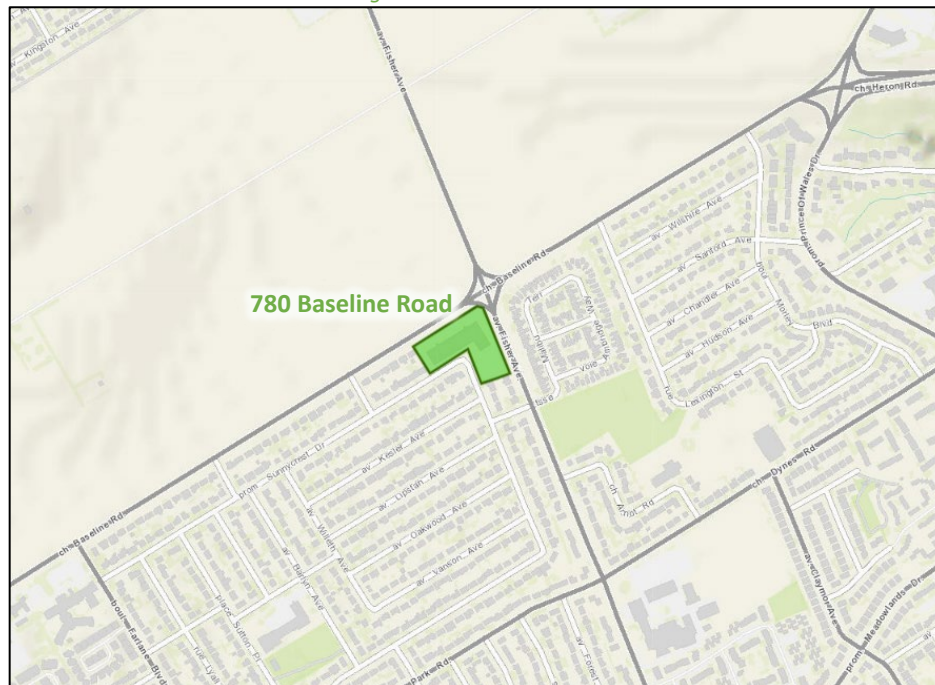
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required including the Network Impact Component. This study has been prepared to support an Official Plan amendment and zoning by-law amendment.

## 2 Existing and Planned Conditions

### 2.1 Proposed Development

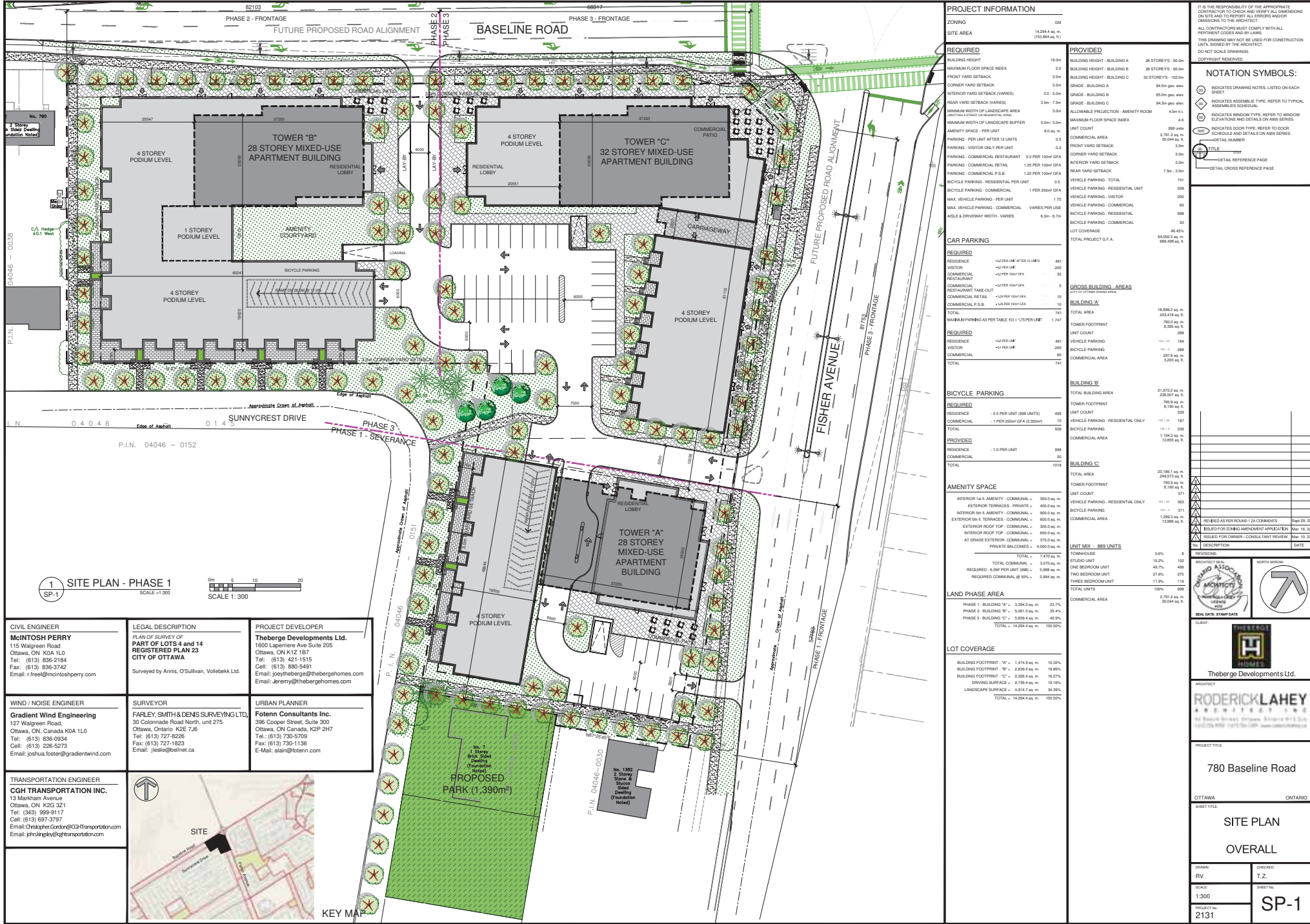
The existing site, located at 780 Baseline Road, is zoned as General Mixed Use (GM) and includes a business strip consisting of retail, service, and restaurant land uses with surrounding surface parking lots. The proposed development is anticipated to include a total of 998 dwelling units and 30,044 sq. ft of commercial space in three mixed-used buildings and is to be constructed across multiple phases with the anticipated full build-out and occupancy horizon is 2034. The first phase is understood to consist of constructing a mixed-use building comprising a 25-storey tower at the south of the parcel in the present location of the surface parking lot. The remaining two phases are understood to include the demolition of the existing business strip and the construction of two mixed-use buildings, one 25-storey tower adjacent to the residential lands to the west, and a 29-storey tower at the Baseline Road and Fisher Avenue intersection. The development proposes the use of an existing right-in-only access on Baseline Road, an existing full-movements access, and a newly proposed outbound access on Fisher Avenue. A total of 508 residential, 200 visitor, 60 retail vehicle parking spaces, and 998 residential and 20 commercial bicycle parking spaces are proposed. The site is located within the Carleton Heights Secondary Plan area. Figure 1 illustrates the Study Area Context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 11, 2022

Figure 2: Concept Plan



PROJECT INFORMATION	
ZONING	GM
SITE AREA	14,294 sq. m. (332,848 sq. ft.)

REQUIRED	PROVIDED
BUILDING HEIGHT	28 STOREYS - 98.2m
MAXIMUM FLOOR SPACE INDEX	2.0
FRONT YARD SETBACK	3.0m
CORNER YARD SETBACK	3.0m
INTERIOR YARD SETBACK (VARIES)	0.5 - 5.0m
MINIMUM WIDTH OF LANDSCAPE BUFFER (OUTSIDE A TRAIL OR GREENWAY)	3.0m
MINIMUM WIDTH OF LANDSCAPE BUFFER (OUTSIDE A TRAIL OR GREENWAY)	3.0m
AMENITY SPACE - PER UNIT	6.8 sq. m.
PARKING - VISITOR ONLY PER UNIT	0.2
PARKING - COMMERCIAL RESTAURANT	5.0 PER 100sq GFA
PARKING - COMMERCIAL RETAIL	1.25 PER 100sq GFA
PARKING - COMMERCIAL P.S.B.	1.25 PER 100sq GFA
BICYCLE PARKING - RESIDENTIAL PER UNIT	0.5
BICYCLE PARKING - COMMERCIAL	1 PER 200sq GFA
MAX. VEHICLE PARKING - PER UNIT	1.75
MAX. VEHICLE PARKING - COMMERCIAL	VARIES PER USE
ASILE & DRIVEWAY WIDTH - VARIES	6.0m - 6.7m

REQUIRED	PROVIDED
RESIDENCE	+40 PER UNIT AFTER 15 UNITS
RESTAURANT	+40 PER UNIT
COMMERCIAL	+40 PER UNIT
RESTAURANT TAKE-OUT	+40 PER UNIT
COMMERCIAL RETAIL	+40 PER UNIT
COMMERCIAL P.S.B.	+40 PER UNIT
TOTAL	1,747

REQUIRED	PROVIDED
RESIDENCE	+40 PER UNIT
RESTAURANT	+40 PER UNIT
COMMERCIAL	60
TOTAL	741

REQUIRED	PROVIDED
RESIDENCE	-0.5 PER UNIT (998 UNITS)
COMMERCIAL	-1 PER 200sq GFA (0.33 PER UNIT)
TOTAL	1,994 + 339

REQUIRED	PROVIDED
RESIDENCE	-1.0 PER UNIT
COMMERCIAL	20
TOTAL	1018

AMENITY SPACE	
INTERIOR 1st & AMENITY - COMMUNAL	300.0 sq. m.
EXTERIOR TERRACES - PRIVATE	400.0 sq. m.
INTERIOR 2nd & AMENITY - COMMUNAL	900.0 sq. m.
EXTERIOR 2nd & TERRACES - COMMUNAL	600.0 sq. m.
EXTERIOR ROOF TOP - COMMUNAL	300.0 sq. m.
INTERIOR ROOF TOP - COMMUNAL	600.0 sq. m.
AT GRADE EXTERIOR - COMMUNAL	370.0 sq. m.
PRIVATE BALCONIES	4,000.0 sq. m.
TOTAL COMMUNAL	5,570.0 sq. m.
REQUIRED - 6.8MP PER UNIT (998)	5,388.0 sq. m.
REQUIRED COMMUNAL @ 50%	2,785.0 sq. m.

LAND PHASE AREA	
PHASE 1 - BUILDING "A"	3,394.0 sq. m. - 23.7%
PHASE 2 - BUILDING "B"	5,051.0 sq. m. - 35.4%
PHASE 3 - BUILDING "C"	5,839.0 sq. m. - 40.9%
TOTAL	14,284.0 sq. m. - 100.00%

LOT COVERAGE	
BUILDING FOOTPRINT - "A"	1,474.9 sq. m. - 10.32%
BUILDING FOOTPRINT - "B"	2,035.0 sq. m. - 14.24%
BUILDING FOOTPRINT - "C"	2,326.4 sq. m. - 16.27%
DRIVING SURFACE	2,739.4 sq. m. - 19.16%
LANDSCAPE SURFACE	4,917.7 sq. m. - 34.23%
TOTAL	14,294.4 sq. m. - 100.00%

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNLESS SIGNED BY THE ARCHITECT. DO NOT SCALE DRAWINGS. COPYRIGHT RESERVED.

**NOTATION SYMBOLS:**

- INDICATES DRAWING NOTES LISTED ON EACH SHEET.
- INDICATES ASSEMBLY TYPE. REFER TO TYPICAL ASSEMBLY SCHEDULE.
- INDICATES WINDOW TYPE. REFER TO WINDOW ELEVATIONS AND DETAILS ON AREA SERIES.
- INDICATES DOOR TYPE. REFER TO DOOR SCHEDULE AND DETAILS ON AREA SERIES.
- INDICATES DETAIL REFERENCE PAGE.
- INDICATES DETAIL CROSS REFERENCE PAGE.

**1 SITE PLAN - PHASE 1**  
SCALE 1:300

CIVIL ENGINEER  
**McINTOSH PERRY**  
115 Walgreen Road  
Ottawa, ON K0A 1L0  
Tel: (613) 836-2184  
Fax: (613) 836-3742  
Email: r.freed@mcintoshperry.com

LEGAL DESCRIPTION  
PLAN OF SURVEY OF  
**PART OF LOTS 4 and 14  
REGISTERED PLAN 23  
CITY OF OTTAWA**  
Surveyed by Annis, O'Sullivan, Volebekk Ltd.

PROJECT DEVELOPER  
**Theberge Developments Ltd.**  
1600 Lapiniere Ave Suite 205  
Ottawa, ON K1Z 1B7  
Tel: (613) 421-1515  
Cell: (613) 880-5491  
Email: joesy@theberge.com  
Email: jeremy@theberghomes.com

WIND / NOISE ENGINEER  
**Gradient Wind Engineering**  
127 Walgreen Road,  
Ottawa, ON, Canada K0A 1L0  
Tel: (613) 836-0934  
Cell: (613) 226-5273  
Email: joshua.foster@gradientwind.com

SURVEYOR  
**FARLEY, SMITH & DENIS SURVEYING LTD.**  
30 Colonnade Road North, unit 275  
Ottawa, Ontario K2E 7J6  
Tel: (613) 727-8226  
Fax: (613) 727-1823  
E-Mail: jseid@fsdinet.ca

URBAN PLANNER  
**Fotenn Consultants Inc.**  
306 Cooper Street, Suite 300  
Ottawa, ON Canada, K2P 2H7  
Tel: (613) 730-5709  
Fax: (613) 730-1136  
E-Mail: arian@fotenn.com

TRANSPORTATION ENGINEER  
**CGH TRANSPORTATION INC.**  
13 Markham Avenue  
Ottawa, ON K2G 3Z1  
Tel: (416) 909-9117  
Cell: (613) 697-3797  
Email: Christopher.Gordon@CGHtransportation.com  
Email: jpmingley@cgtransportation.com

KEY MAP

## 2.2 Existing Conditions

### 2.2.1 Area Road Network

**Baseline Road:** Baseline Road is a City of Ottawa arterial road with a divided four-lane urban cross-section. Sidewalks are provided on the south side of the roadway, at intersections and bus stops on the north side of the road to the west, and on both sides of the road to the east of Prince of Wales Drive. The posted speed limit is 60 km/h within the study area and the City-protected right of way is 44.5 metres. Baseline Road is designated as a truck route.

**Heron Road:** Heron Road is a City of Ottawa arterial road with a divided six-lane urban cross-section, including bus lanes and sidewalks on both sides of the road. Bike lanes are present over the Heron Bridge. The posted speed limit is 60 km/h within the study area and the City-protected right of way is 44.5 metres. Heron Road is designated as a truck route.

**Fisher Avenue:** Fisher Avenue is a City of Ottawa arterial road with a two-lane rural cross-section with paved shoulders on both sides of the road. North of Baseline Road, a sidewalk is present on the west side of the road and sidewalks are present on both sides of the road to the south. The posted speed limit is 50 km/h, the City-protected right of way is 34.0 metres north of Baseline Road, and the measured right of way varies between 24.5 and 30.0 metres south of Baseline Road within the study area. Fisher Avenue is designated as a truck route.

**Prince of Wales Drive:** Prince of Wales Drive is a City of Ottawa arterial road with a two-lane semi-urban cross-section to the north and a two-lane urban cross-section to the south of Baseline Road. To the north, a paved shoulder is provided on the west side of the road and a curbside bike lane with a sidewalk is provided on the east side of the road within the study area. South of Baseline Road, sidewalks are provided on both sides of the road and bike lanes transition to cycletracks. The posted speed limit is 60 km/h north of Baseline Road and 50 km/h south of Baseline Road. The city-protected right of way is 26.0 metres to the north, and the measured right of way varies between 28.5 and 73.5 metres to the south of Baseline Road. Prince of Wales Drive is designated as a truck route.

**Deer Park Road:** Deer Park Road is a City of Ottawa collector road with a two-lane urban cross-section. Sidewalks are present on both sides of the road east of Millbrook Crescent and on the south side of the road to the west. The posted speed limit is 40 km/h, and the City-protected right of way is 26.0 metres.

**Dynes Road:** Dynes Road is a City of Ottawa collector road with a two-lane urban cross-section. Sidewalks and bike lanes are present on both sides of the road. The posted speed limit is 50 km/h, and the measured right of way is 18.0 metres.

**Sunnycrest Drive:** Sunnycrest Drive is a City of Ottawa local road with a two-lane urban cross-section with on-street parking permitted on both sides of the road. The posted speed limit is 40 km/h and the measured right of way is 20.0 metres.

**Hilliard Avenue:** Hilliard Avenue is a City of Ottawa local road with a two-lane urban cross-section with on-street parking permitted on both sides of the road. The posted speed limit is 40 km/h and the measured right of way is 20.0 metres.

### 2.2.2 Existing Intersections

The existing signalized area intersections within 400 metres of the site have been summarized below and comprise only Baseline Road at Fisher Avenue. The intersection of Baseline Road/Heron Road at Prince of Wales Drive has additionally been included as a key intersection for the purposes of this study:

*Fisher Avenue at Baseline Road*

The intersection of Fisher Avenue at Baseline Road is a signalized intersection. The northbound and southbound approaches each consist of an auxiliary left-turn lane, two through lanes, and a channelized auxiliary right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, two through lanes, and a channelized auxiliary right-turn lane, and the westbound approach consists of two auxiliary left-turn lanes, a through lane and a shared through/channelized right-turn lane. Eastbound and westbound U-turn movements are prohibited, and trucks are prohibited from making westbound left turns.

*Prince of Wales Drive at Baseline Road/Heron Road*

The intersection of Prince of Wales Drive at Baseline Road and Heron Road is a signalized intersection. The northbound and southbound approaches each consist of an auxiliary left-turn lane, two through lanes, a floating bike lane, and a channelized auxiliary right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, two through lanes, an auxiliary through lane, and a channelized auxiliary right-turn lane, and the westbound approach consists of two auxiliary left-turn lanes, two through lanes, a transit queue-jump lane, and a channelized auxiliary right-turn lane. No turn restrictions were noted.

*Fisher Avenue at Deer Park Road / Dynes Road*

The intersection of Fisher Avenue at Deer Park Road/Dynes Road is a signalized intersection. The northbound approach consists of a shared left-turn/through lane and a right-turn lane, and the southbound approach consists of a shared left-turn/through lane and an auxiliary through/right-turn lane. The eastbound and westbound approaches each consist of a shared all-movement lane. Cycle tracks are provided on all approaches. No turn restrictions were noted.

2.2.3 Existing Driveways

Within 200 metres of the site accesses, eight driveways semi-detached and detached dwellings are located on the west side of Baseline Road. Eight driveways semi-detached and detached dwellings are present on the south side of Fisher Avenue. None of the driveways within the area of consideration are significant traffic generators. Figure 3 illustrates the existing driveways.



Figure 3: Existing Driveways



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 11, 2022

#### 2.2.4 Cycling and Pedestrian Facilities

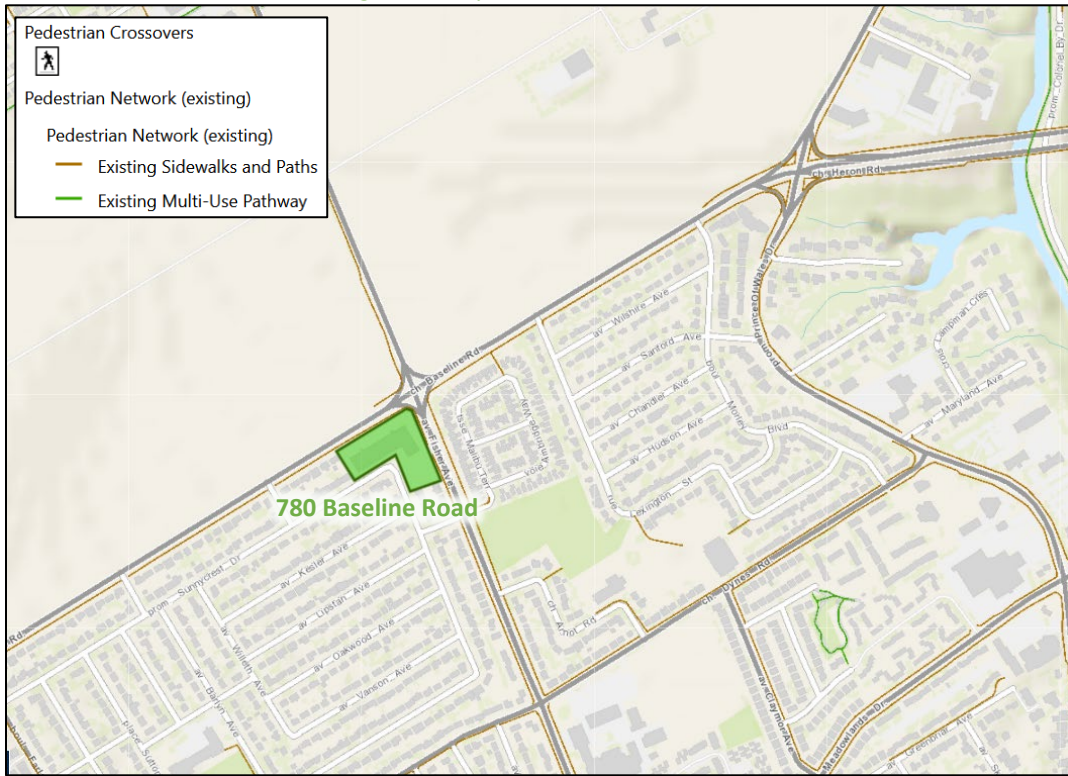
Figure 4 illustrates the pedestrian facilities in the study area and Figure 5 illustrates the cycling facilities.

Sidewalks are provided along the south side of Baseline Road and Deer Park Road west of Millbrook Crescent, on the east side of Prince of Wales Drive, on the west side of Fisher Avenue north of Baseline Road, on both sides of Fisher Avenue south of Baseline Road, Dynes Road, and Deer Park Road east of Millbrook Crescent. Sidewalks are also present at intersections and bus stops on the north side of Baseline Road to the west of Fisher Avenue.

A paved shoulder is present on both sides of Fisher Avenue except through the intersection with Baseline Avenue where bike lanes are present and on the east side of the road between Malibu Terrace and the auxiliary northbound right turn lane taper at Baseline Road where a cycletrack is present. Cycletracks are also present at the Fisher Avenue at Deer Park Road/Dynes Road intersection, and bike lanes are present along Dynes Road.

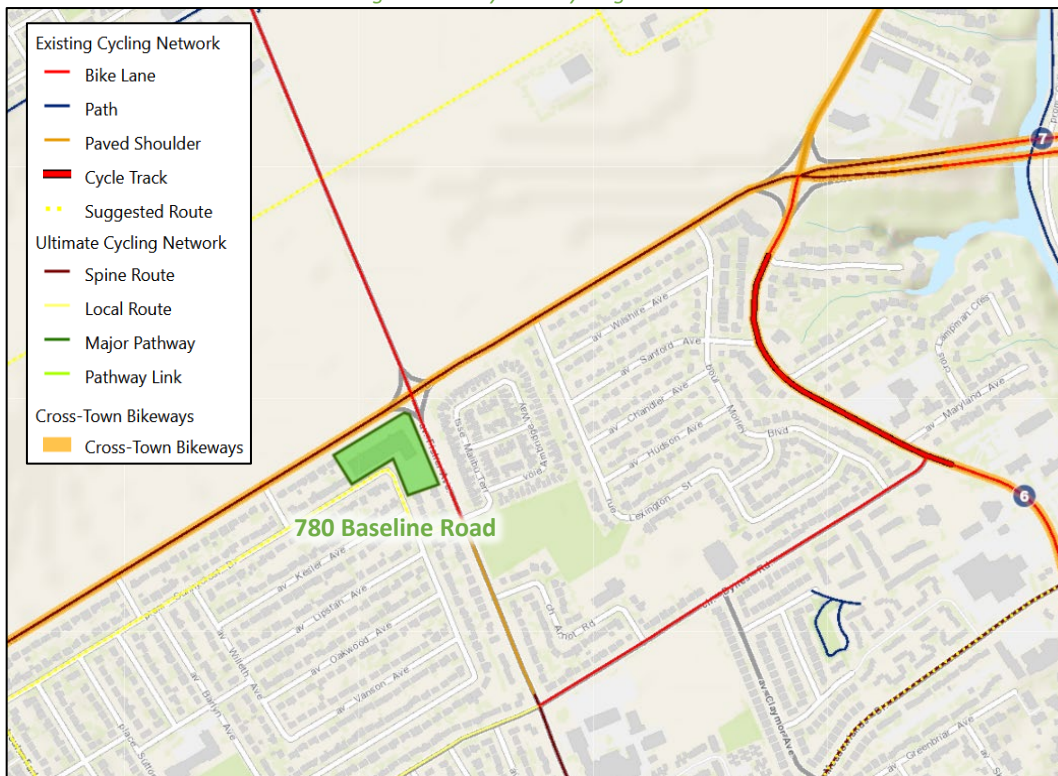
Fisher Avenue, Prince of Wales Drive, Baseline Road, and Heron Road are spine routes. Baseline Road, Heron Road and Prince of Wales Drive are cross-town bikeways. Malibu Terrace west of Fisher Avenue, Hilliard Avenue north of Malibu Terrace, Sunnycrest Drive, Deer Park Road, Dynes Road, and McCooey Lane are local routes.

Figure 4: Study Area Pedestrian Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 11, 2022

Figure 5: Study Area Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 11, 2022

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 6 and Figure 7 respectively.

Figure 6: Existing Pedestrian Volumes

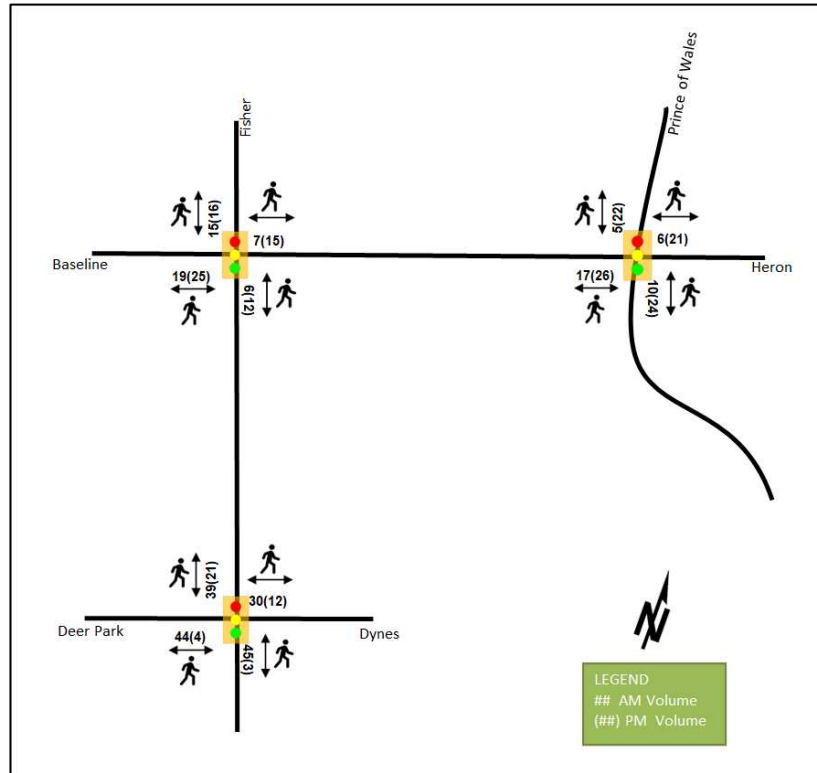
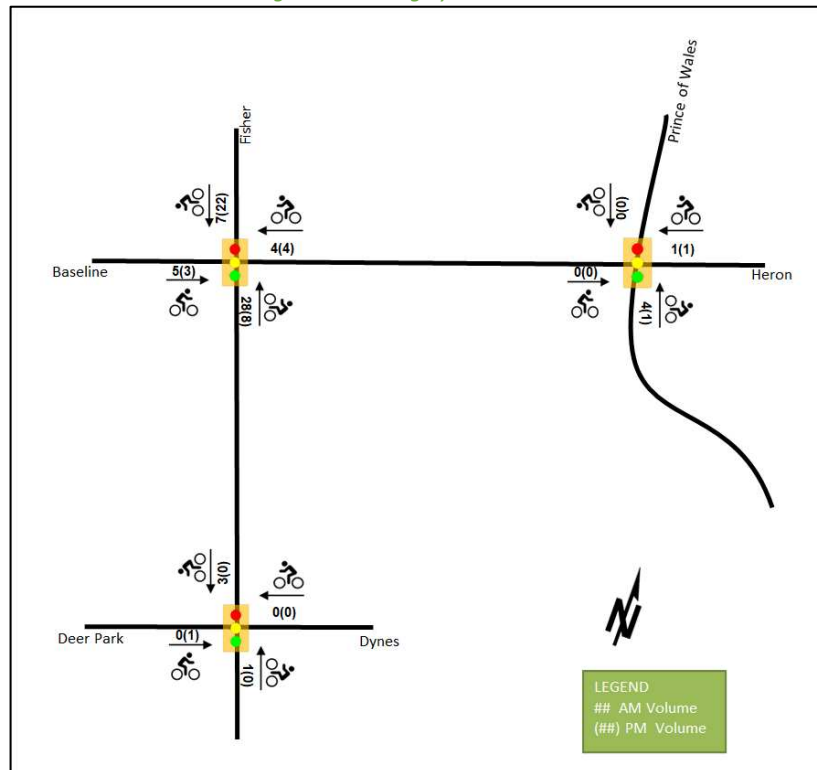


Figure 7: Existing Cyclist Volumes



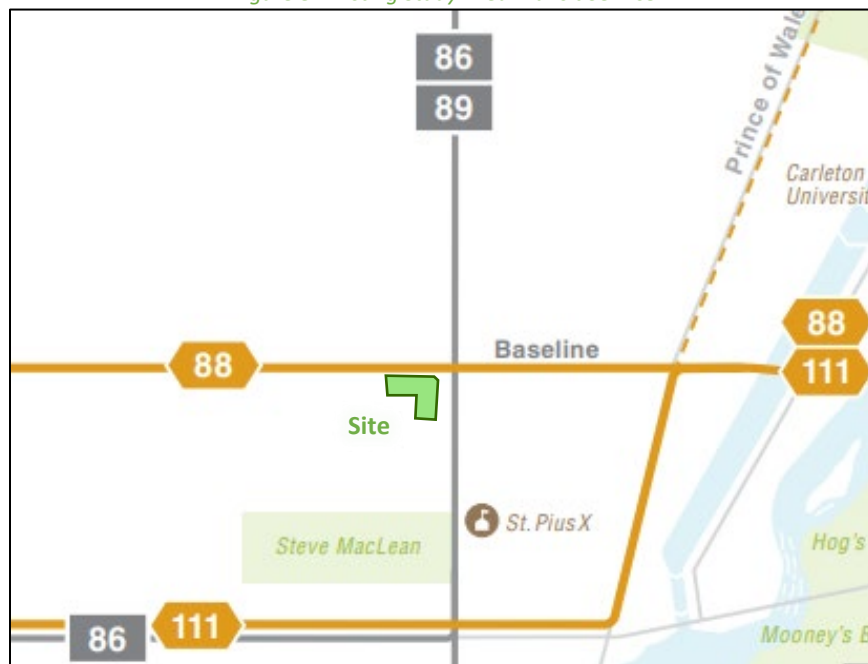
### 2.2.5 Existing Transit

Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates nearby transit stops. All transit information is from May 11, 2022 and is included for general information purposes and context to the surrounding area.

Within the study area, routes #86 and #89 travel along Fisher Avenue and route #88 travels along Baseline Road and Heron Road. Primary stops are located at Marson Street at Baseline Road and Fisher Avenue at Baseline Road intersections. The frequency of these routes within proximity of the proposed site based on May 11, 2022 service levels are:

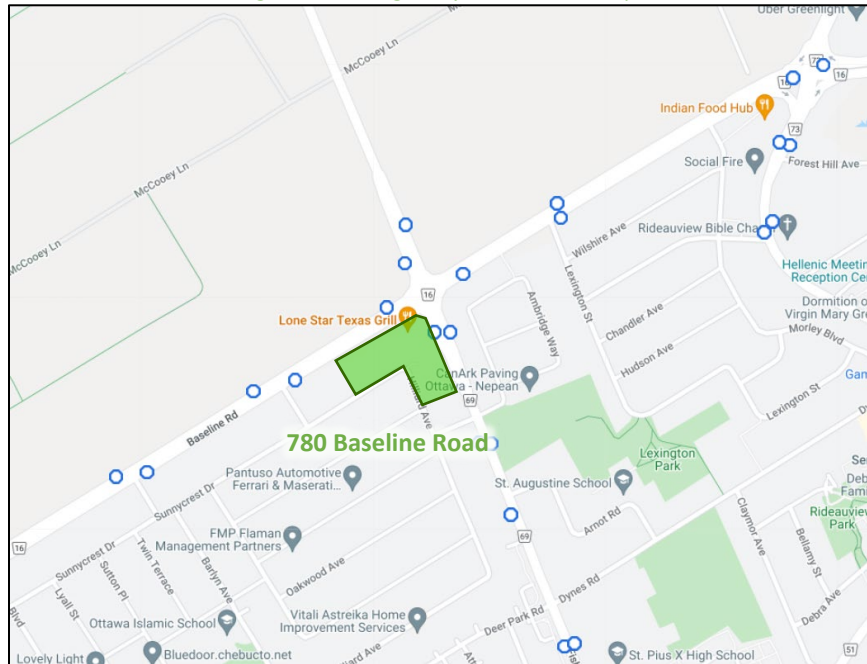
- Route # 86 – 15-minute service in the peak period/direction, 30-minute service all day
- Route # 88 – 10-12-minute service in the peak period/direction, 15-minute service all day
- Route # 89 – 15-minute service in the peak period/direction, 30-minute service all day

Figure 8: Existing Study Area Transit Service



Source: <http://www.octranspo.com/> Accessed: May 11, 2022

Figure 9: Existing Study Area Transit Stops



Source: <http://www.octranspo.com/> Accessed: May 11, 2022

2.2.6 Existing Area Traffic Management Measures

The primary traffic calming measure within the study area is on-road messaging stating the speed limit on Sunnycrest Drive.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa for the existing Study Area intersection. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date
Fisher Avenue at Baseline Road	Wednesday, August 03, 2016
Prince of Wales Drive at Baseline Road/Heron Road	Wednesday, March 04, 2020
Fisher Avenue at Deer Park Road/Dynes Road	Wednesday, March 09, 2016

Figure 10 illustrates the existing traffic counts, balanced along the Baseline Road and Fisher Avenue corridors, and Table 2 summarizes the existing intersection operations. At the time of the Prince of Wales Drive at Baseline Road/Heron Road turning movement count, the Hog’s Back Bridge was closed, and it is noted that the count includes detour volumes from this closure. The level of service for signalized intersections is based on the volume to capacity ratio (v/c) calculation for individual lane movements and HCM 2000 v/c calculations for the overall intersection. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 10: Existing Traffic Counts

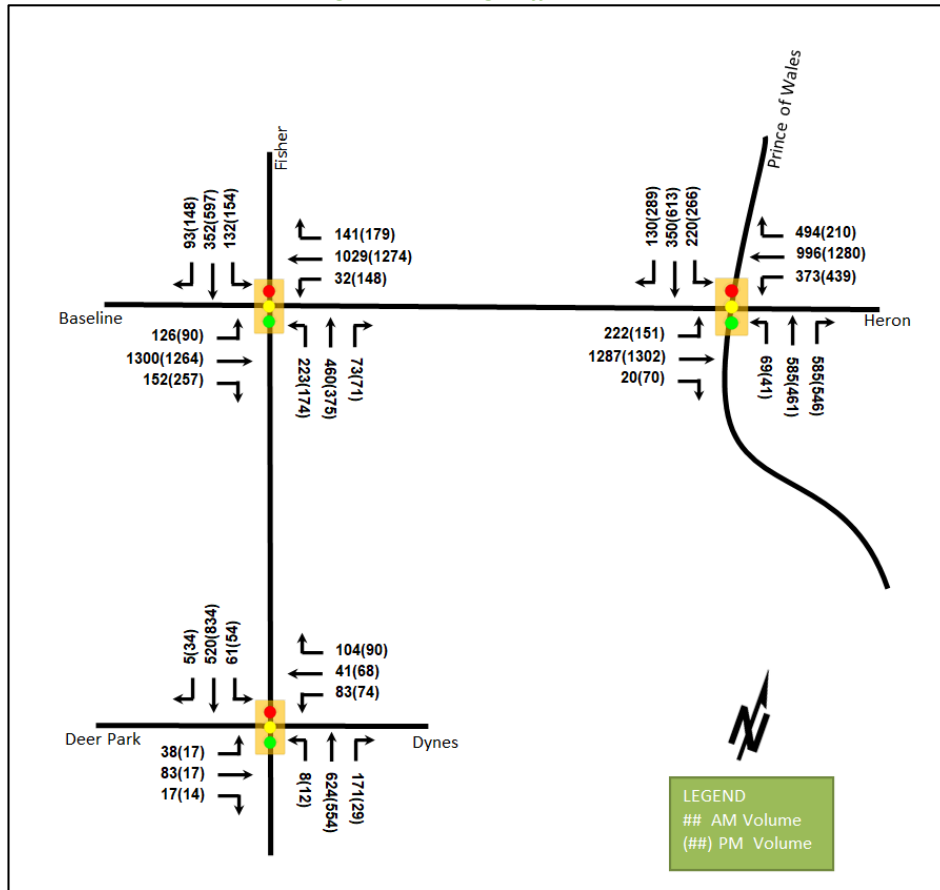


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
Fisher Avenue at Baseline Road Signalized	EBL	B	0.70	73.0	55.3	B	0.64	74.7	43.2
	EBT	E	0.95	49.6	#272.2	F	1.08	86.2	#266.5
	EBR	A	0.23	3.8	12.2	A	0.45	18.6	55.9
	WBL	A	0.23	82.3	m2.7	A	0.57	64.0	32.0
	WBT/R	F	1.14	91.0	m112.3	F	1.26	156.8	#328.2
	NBL	D	0.86	78.6	#100.0	D	0.85	86.3	#86.3
	NBT	C	0.73	53.6	81.1	B	0.65	53.7	70.5
	NBR	A	0.18	0.9	0.0	A	0.21	2.4	2.3
	SBL	C	0.76	79.3	#62.8	C	0.79	79.9	#72.4
	SBT	C	0.76	62.4	66.7	F	1.07	106.8	#136.5
	SBR	A	0.25	1.4	0.0	A	0.43	13.9	24.6
<b>Overall</b>	<b>E</b>	<b>0.98</b>	<b>62.8</b>	-	-	<b>F</b>	<b>1.07</b>	<b>99.6</b>	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
<b>Prince of Wales Drive at Baseline Road/Heron Road Signalized</b>	EBL	<b>F</b>	<b>1.28</b>	<b>198.6</b>	<b>m#93.0</b>	<b>F</b>	<b>1.63</b>	<b>361.0</b>	<b>#107.8</b>
	EBT/R	<b>F</b>	<b>1.16</b>	<b>106.8</b>	<b>m#179.4</b>	<b>F</b>	<b>1.20</b>	<b>139.0</b>	<b>#206.3</b>
	WBL	D	0.82	66.1	70.2	<b>F</b>	<b>1.24</b>	<b>174.3</b>	<b>#114.8</b>
	WBT	<b>F</b>	<b>1.87</b>	<b>426.7</b>	<b>#268.6</b>	<b>F</b>	<b>1.59</b>	<b>305.7</b>	<b>#319.7</b>
	WBR	D	0.87	25.5	#90.8	A	0.42	7.1	19.8
	NBL	A	0.53	69.3	34.4	A	0.32	62.4	24.0
	NBT	D	0.82	56.2	105.8	B	0.62	47.5	81.0
	NBR	<b>F</b>	<b>1.05</b>	<b>71.4</b>	<b>#177.9</b>	<b>F</b>	<b>1.10</b>	<b>95.6</b>	<b>#196.2</b>
	SBL	<b>F</b>	<b>1.06</b>	<b>129.1</b>	<b>#120.1</b>	<b>F</b>	<b>1.13</b>	<b>144.4</b>	<b>#145.1</b>
	SBT/R	A	0.53	37.8	78.7	E	0.96	61.8	#172.4
<b>Overall</b>	<b>F</b>	<b>1.03</b>	<b>144.8</b>	-	<b>F</b>	<b>1.34</b>	<b>156.2</b>	-	
<b>Fisher Avenue at Deer Park Road/Dynes Road Signalized</b>	EB	A	0.44	26.4	31.2	A	0.18	23.0	14.2
	WB	B	0.69	30.3	46.5	C	0.80	48.3	62.2
	NBL/T	B	0.70	18.7	#148.5	A	0.57	12.9	105.0
	NBR	A	0.23	2.5	9.1	A	0.03	1.6	2.4
	SBL	A	0.44	11.6	46.4	A	0.55	11.3	77.7
	<b>Overall</b>	<b>B</b>	<b>0.69</b>	<b>16.8</b>	-	<b>B</b>	<b>0.62</b>	<b>16.7</b>	-

Notes: Saturation flow rate of 1800 veh/h/lane  
Queue is measured in metres  
Peak Hour Factor = 0.90

V/C = volume-to-capacity ratio  
m = metered queue  
# = volume for the 95th %ile cycle exceeds capacity

Generally, the study area intersections experience capacity issues and significant delays along Baseline Road during both AM and PM peak hours.

At the intersection of Fisher Avenue at Baseline Road, movements that are over theoretical capacity and may be subject to high delays and extended queues are the westbound shared through/right-turn movement during AM peak hour and the eastbound through, westbound shared through/right-turn, and southbound through movements during PM peak hour. Extended queues may also be exhibited on the eastbound through movement during AM peak hour, and on the northbound and southbound left-turn movements during both peak hours. High delays may be experienced on the westbound left-turn movement during AM peak hour and on the northbound left-turn movement during PM peak hour. The overall intersection operates over theoretical capacity with high delays during the PM peak hour.

The intersection of the Prince of Wales Drive at Baseline Road/Heron Road may exhibit extended queues on the westbound right-turn movement during AM peak hour and on the southbound shared through/right-turn movement during PM peak hour. The eastbound and southbound left-turn, eastbound shared through right-turn, westbound through, and northbound right-turn movements are over theoretical capacity and may be subject to high delays and extended queues during both peak hours as with the westbound left-turn during PM peak hour. The overall intersection operates over theoretical capacity and may be subject to high delays during both peak hours.

At the intersection of Fisher Avenue at Deer Park Road/Dynes Road intersection, extended queues may be exhibited on the northbound left-turn/through movements during AM peak hour.

### 2.2.8 Collision Analysis

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

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

Table 3: Study Area Collision Summary, 2015-2019

Total Collisions		Number	%
		<b>133</b>	<b>100%</b>
Classification	Fatality	1	1%
	Non-Fatal Injury	24	18%
	Property Damage Only	108	82%
Initial Impact Type	Angle	8	6%
	Rear end	87	65%
	Sideswipe	17	13%
	Turning Movement	8	6%
	SMV Unattended	1	1%
	SMV Other	8	6%
	Other	4	3%
Road Surface Condition	Dry	95	71%
	Wet	19	14%
	Loose Snow	8	6%
	Slush	3	2%
	Packed Snow	5	4%
	Ice	3	2%
Pedestrian Involved		4	3%
Cyclists Involved		1	1%

Figure 11: Study Area Collision Records – Representation of 2015-2019

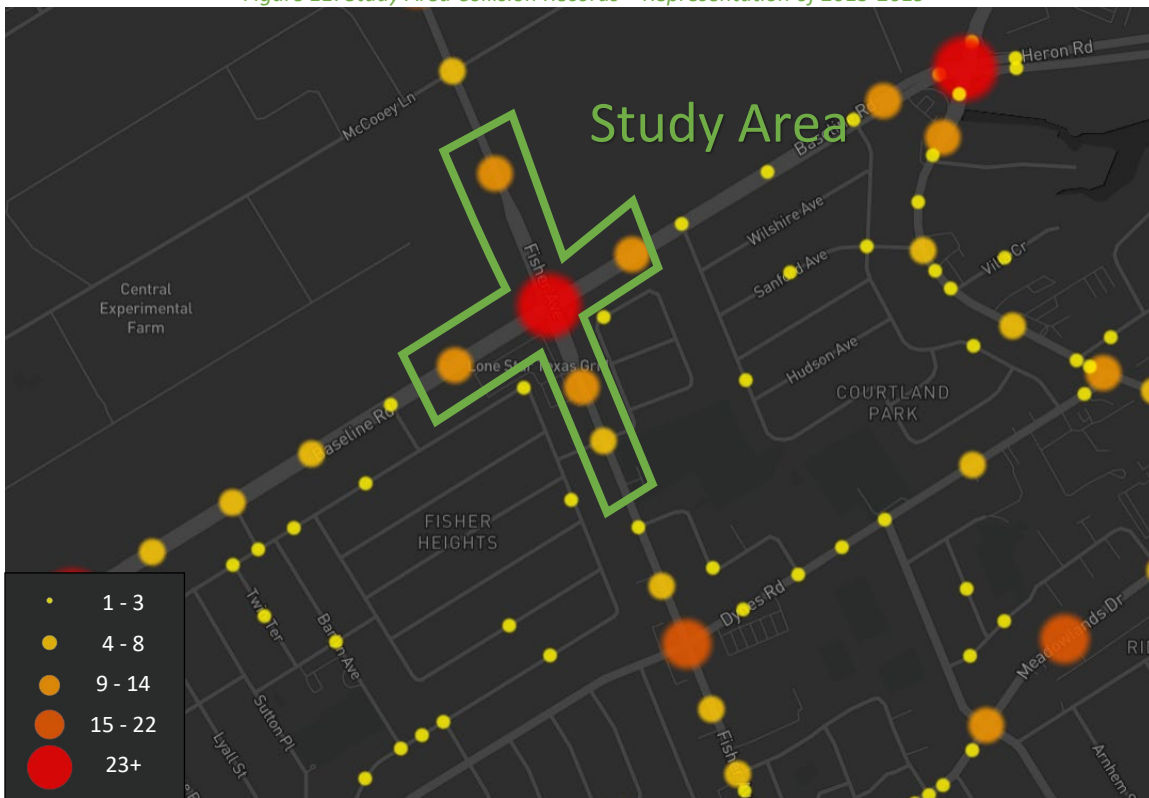




Table 4: Summary of Collision Locations, 2015-2019

	Number	%
<b>Intersections / Segments</b>	<b>133</b>	<b>100%</b>
<b>Fisher Ave @ Baseline Rd</b>	81	61%
<b>Fisher Ave @ Malibu Ter</b>	7	5%
<b>Baseline Rd btwn Marson St &amp; Fisher Ave</b>	12	9%
<b>Baseline Rd btwn Fisher Ave &amp; Lexington St</b>	10	8%
<b>Fisher Ave btwn McCooey Lane &amp; Baseline Rd</b>	13	10%
<b>Fisher Ave btwn Baseline Rd &amp; Malibu Ter</b>	10	8%

Within the study area, the intersection of Fisher Avenue at Baseline Road and segments of Baseline Road between Marson Street and Fisher Avenue, and Fisher Avenue between McCooey Lane and Baseline Road are noted to have experienced higher collisions than other locations. Table 5, Table 6, and Table 7 summarize the collision types and conditions for each of these locations respectively.

Table 5: Fisher Avenue at Baseline Road Collision Summary

		Number	%
<b>Total Collisions</b>		<b>81</b>	<b>100%</b>
<b>Classification</b>	<b>Fatality</b>	1	1%
	<b>Non-Fatal Injury</b>	9	11%
	<b>Property Damage Only</b>	71	88%
<b>Initial Impact Type</b>	<b>Angle</b>	2	2%
	<b>Rear end</b>	59	73%
	<b>Sideswipe</b>	11	14%
	<b>Turning Movement</b>	2	2%
	<b>SMV Unattended</b>	1	1%
	<b>SMV Other</b>	5	6%
	<b>Other</b>	1	1%
<b>Road Surface Condition</b>	<b>Dry</b>	60	74%
	<b>Wet</b>	7	9%
	<b>Loose Snow</b>	7	9%
	<b>Slush</b>	2	2%
	<b>Packed Snow</b>	2	2%
	<b>Ice</b>	3	4%
<b>Pedestrian Involved</b>		3	4%
<b>Cyclists Involved</b>		1	1%

The Fisher Avenue at Baseline Road intersection had a total of 81 collisions during the 2015-2019 time period, including one angle collision involving a fatality. The fatality occurred during the morning at 7:46 am in dry driving conditions in November 2018, where a pedestrian was killed as a result of a two-vehicle collision. Seventy-one collisions had property damage only and the remaining nine having non-fatal injuries. The collision types are most represented by rear end with 59, followed by 11 sideswipe collisions, five SMV other collisions, two collisions each for angle and turning movement, and with the remaining collisions as SMV unattended and other. Rear end collisions are typical of congested areas and the sideswipe collisions may be influenced by the channelized right-turn runout lanes and merging movements required around the intersection. No further patterns are noted. Weather conditions do not affect collisions at this location. No further examination is required as part of this study.

Table 6: Baseline Road between Marson Street and Fisher Avenue Collision Summary

		Number	%
<b>Total Collisions</b>		<b>12</b>	<b>100%</b>
<b>Classification</b>	<b>Fatality</b>	0	0%
	<b>Non-Fatal Injury</b>	4	33%
	<b>Property Damage Only</b>	8	67%
<b>Initial Impact Type</b>	<b>Rear end</b>	10	83%
	<b>Sideswipe</b>	2	17%
<b>Road Surface Condition</b>	<b>Dry</b>	7	58%
	<b>Wet</b>	4	33%
	<b>Packed Snow</b>	1	8%
<b>Pedestrian Involved</b>		0	0%
<b>Cyclists Involved</b>		0	0%

The segment of Baseline Road between Marson Street and Fisher Avenue had a total of 12 collisions during the 2015-2019 time period, with eight involving property damage only and the remaining four having non-fatal injuries. The collision types are most represented by rear end with ten collisions, followed by two sideswipe collisions. Rear end collisions are typical of congested conditions. Weather conditions are not considered to affect collisions at this location. No further examination is required as part of this study.

Table 7: Fisher Avenue between McCooley Lane and Baseline Road Collision Summary

		Number	%
<b>Total Collisions</b>		<b>13</b>	<b>100%</b>
<b>Classification</b>	<b>Fatality</b>	0	0%
	<b>Non-Fatal Injury</b>	3	23%
	<b>Property Damage Only</b>	10	77%
<b>Initial Impact Type</b>	<b>Rear end</b>	7	54%
	<b>Sideswipe</b>	2	15%
	<b>Turning Movement</b>	2	15%
	<b>SMV Other</b>	2	15%
<b>Road Surface Condition</b>	<b>Dry</b>	8	62%
	<b>Wet</b>	3	23%
	<b>Slush</b>	1	8%
	<b>Packed Snow</b>	1	8%
<b>Pedestrian Involved</b>		0	0%
<b>Cyclists Involved</b>		0	0%

The segment of Fisher Avenue between McCooley Lane and Baseline Road had a total of 13 collisions during the 2015-2019 time period, with ten involving property damage only and the remaining three having non-fatal injuries. The collision types are most represented by rear end with the remaining collisions split between sideswipe, turning movement, and SMV other. As previously stated, rear end collisions are typical of congested areas and no further identifiable patterns are evident in the collision types. Weather conditions are not considered to affect collisions at this location. No further examination is required as part of this study.

### 2.3 Planned Conditions

#### 2.3.1 Changes to the Area Transportation Network

The Transportation Master Plan’s (TMP) Rapid Transit and Transit Priority Network (RTTP) identifies Bus Rapid Transit (BRT) along Baseline Road and Heron Road, and isolated transit priority measures along Fisher Avenue

within the Affordable Network diagram. Isolated transit priority measures are additionally noted in the Network Concept diagram on Prince of Wales Drive south of Baseline Road.

The timing of the Baseline Road Rapid Transit Corridor project is subject to the timing of funding sources. The project includes median BRT lanes and segregated cycling facilities on Baseline Road through the study area. Changes along the site frontage include a new eastbound cycletrack along the south side of Baseline Road and crossrides to the adjacent intersection quadrants, but notably no tie-ins for cycling facilities along Fisher Avenue.

The Baseline Road Rapid Transit Corridor project is assumed to be build-out prior to 2034 and will be analyzed in the future horizons. The future geometry is based upon the preliminary detailed design from the Baseline Road Rapid Transit Corridor project for the site frontage and the Baseline Road at Fisher Avenue intersection provided by the City and illustrated in Figure 12, and the 1111 Prince of Wales Drive TIA (Novatech, 2020) for the intersection Baseline Road/Heron Road at Price and Price of Wales Drive intersection, illustrated in Figure 13.

Figure 12: Baseline Road Rapid Transit Corridor

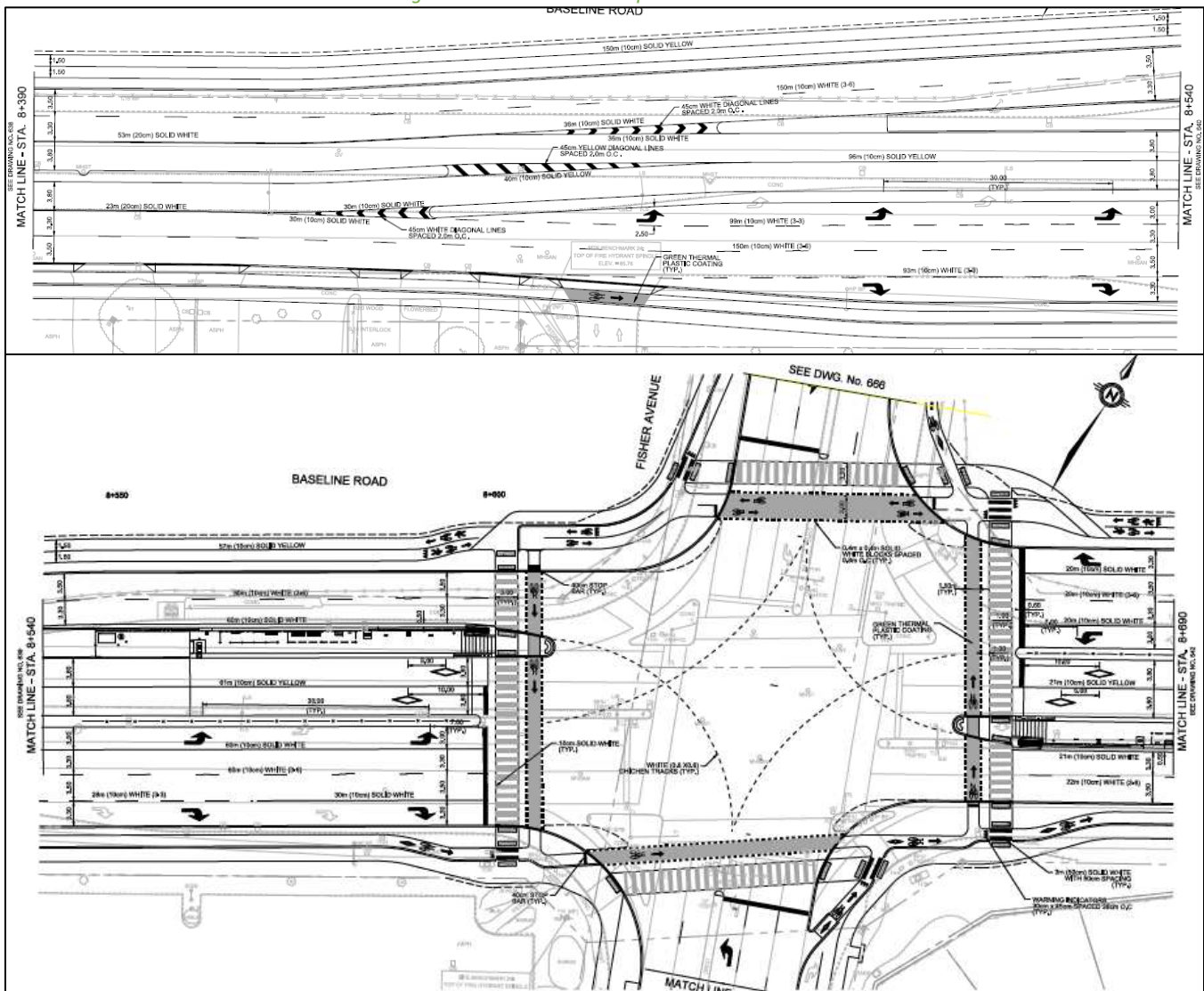
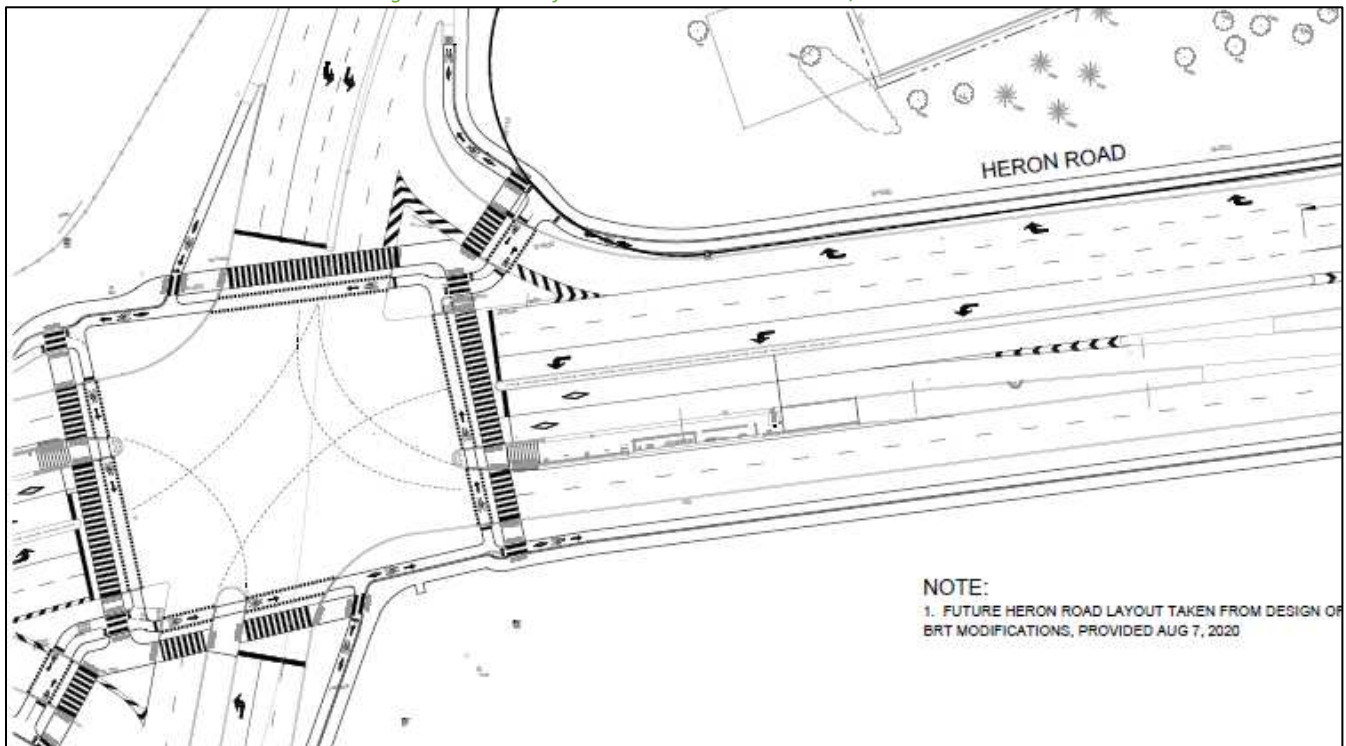


Figure 13: Prince of Wales Drive at Baseline Road/Heron Road



### 2.3.2 Other Study Area Developments

#### 1111 Prince of Wales Drive

The proposed development includes a site plan for additional parking spaces for the office building. The reconfiguration is expected to provide a total of 319 parking spaces. No new trips are expected to / from the site, and the site trips will be reassigned due to the new driveway. (Novatech, 2020)

## 3 Study Area and Time Periods

### 3.1 Study Area

The study area will include the intersections of Fisher Avenue at Baseline Road, Prince of Wales Drive at Baseline Road/Heron Road, Fisher at Deer Park Road/Dynes Road, and the newly proposed site accesses onto Baseline Road and Fisher Avenue.

The boundary roads will be Baseline Road, Fisher Avenue, Sunnycrest Drive, and Hilliard Avenue. TRANS screenlines SL20 and SL27 are located to the east along the Rideau River/Canal and will not be assessed in this study.

### 3.2 Time Periods

As the proposed development is mixed-use development with residential units and commercial units, the AM and PM peak hours will be examined.

### 3.3 Horizon Years

The anticipated build-out year is 2034 for the entire site and this single horizon will be reviewed in support of the OPA/ZBA.

## 4 Exemption Review

Table 8 summarizes the exemptions for this TIA.

*Table 8: Exemption Review*

Module	Element	Explanation	Exempt/Required
<b>Design Review Component</b>			
<b>4.1 Development Design</b>	4.1.2 Circulation and Access	Only required for site plans	Required at Site Plan Application
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
<b>4.2 Parking</b>	4.2.1 Parking Supply	Only required for site plans	Required at Site Plan Application
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt. May be required at Site Plan Application
<b>Network Impact Component</b>			
<b>4.5 Transportation Demand Management</b>	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
<b>4.6 Neighbourhood Traffic Management</b>	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
<b>4.8 Network Concept</b>		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

Examining 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), the existing average district mode shares by land use for Merivale have been summarized in Table 9.

*Table 9: TRANS Trip Generation Manual Recommended Mode Shares – Merivale*

Travel Mode	Multi-Unit (High-Rise)		Commercial Generator	
	AM	PM	AM	PM
<b>Auto Driver</b>	41%	41%	71%	61%
<b>Auto Passenger</b>	6%	11%	19%	16%
<b>Transit</b>	42%	33%	1%	8%
<b>Cycling</b>	2%	2%	0%	1%
<b>Walking</b>	8%	13%	9%	14%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

As a result of the planned cycling and Baseline Road Rapid Transit Corridor project, along which a station at Fisher Avenue will be provided, the site transit and cycling mode shares are expected to surpass the values recommended for the Merivale area. Table 10 summarizes the proposed mode share targets for the subject development.

Table 10: Proposed Development Mode Shares

Travel Mode	Multi-Unit (High-Rise)		Commercial Generator	
	AM	PM	AM	PM
Auto Driver	29%	29%	61%	51%
Auto Passenger	6%	11%	19%	16%
Transit	52%	43%	11%	18%
Cycling	4%	4%	0%	1%
Walking	8%	13%	9%	14%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

## 5.2 Trip Generation

This TIA has been prepared using the vehicle and person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020) and the vehicle trip rates and derived person trip rates for commercial component from the ITE Trip Generation Manual 11th Edition (2017) using the City-prescribed conversion factor of 1.28. Table 11 summarizes the person trip rates for the proposed residential land use for each peak period and the person trip rates for the non-residential land use by peak hour.

Table 11: Trip Generation Person Trip Rates

Land Use	Land Use Code	Peak	Peak Period		Peak Hour	
			Vehicle Trip Rate	Person Trip Rates	Vehicle Trip Rate	Person Trip Rates
Multi-Unit (High-Rise)	221 & 222 (TRANS)	AM	-	0.80	-	-
		PM	-	0.90	-	-
Retail (<40k sq. ft.)	822 (ITE)	AM	-	-	2.36	3.02
		PM	-	-	6.59	8.36

Using the above person trip rates, the total person trip generation has been estimated. Table 12 summarizes the total person trip generation for the residential land use and for the non-residential land use.

Table 12: Total Person Trip Generation

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit (High-Rise)	998	247	551	798	521	377	898
Land Use	GFA (sq. ft.)	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Retail (<40k sq. ft.)	30,044	55	36	91	127	127	254

Internal capture rates from the ITE Trip Generation Handbook 3<sup>rd</sup> Edition have been assigned to the development's retail component for mixed-use developments. The rates summarized in Table 13 represent the percentage of trips to/from the retail use based on the residential component.

Table 13: Internal Capture Rates

Land Use	AM		PM	
	In	Out	In	Out
Residential to/from Retail	17%	14%	10%	26%

Pass-by reductions applied to the retail trip generation at a rate of 40% have been included using the recommended value presented in the ITE Trip Generation Manual 11th Edition (2021) for the most similar land use with a recommended rate, "Retail (40k – 150k sq. ft.)".

Using the above mode share targets for a BRT area, the internal capture and pass-by rates, and the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 14 summarizes the total trip generation.

Table 14: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (High-Rise)	Auto Driver	29%	35	77	112	29%	66	48	114
	Auto Passenger	6%	7	16	23	11%	25	18	43
	Transit	52%	70	158	228	43%	105	76	181
	Cycling	4%	6	13	19	4%	10	7	17
	Walking	8%	12	26	38	13%	35	25	60
	<b>Total</b>	<b>100%</b>	<b>130</b>	<b>290</b>	<b>420</b>	<b>100%</b>	<b>241</b>	<b>174</b>	<b>415</b>
Retail (<40k sq. ft.)	Auto Driver	61%	8	6	14	51%	10	4	14
	Auto Passenger	19%	9	6	15	16%	19	17	36
	Transit	11%	5	4	9	18%	21	19	40
	Cycling	0%	0	0	0	1%	1	1	2
	Walking	9%	4	3	7	14%	17	15	32
	Pass-by	40%	-22	-14	-36	40%	-51	-51	-102
	Internal Capture	varies	-6	-3	-9	varies	-8	-20	-28
<b>Total</b>	<b>100%</b>	<b>26</b>	<b>19</b>	<b>45</b>	<b>100%</b>	<b>68</b>	<b>56</b>	<b>124</b>	
Total	Auto Driver	-	43	83	126	-	76	52	128
	Auto Passenger	-	16	22	38	-	44	35	79
	Transit	-	75	162	237	-	126	95	221
	Cycling	-	6	13	19	-	11	8	19
	Walking	-	16	29	45	-	52	40	92
	<b>Total</b>	-	<b>156</b>	<b>309</b>	<b>465</b>	-	<b>309</b>	<b>230</b>	<b>539</b>

As shown above, a total of 126 AM and 128 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, and these patterns were applied based on the build-out of Merivale. Table 15 below summarizes the distributions.

Table 15: OD Survey Distribution – Merivale

To/From	% of Trips
North	30%
South	25%
East	20%
West	25%
<b>Total</b>	<b>100%</b>

### 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. Table 16 summarizes the proportional assignment to the study area roadways, and Figure 14 and Figure 15 illustrate the new site generated volumes and pass-by volumes, respectively.

Table 16: Trip Assignment

To/From	Inbound Via	Outbound Via
<b>North</b>	20% Fisher Ave (N) 10% Prince of Wales Dr (N)	20% Fisher Ave (N) 10% Prince of Wales Dr (N)
<b>South</b>	10% Fisher Ave (S) 15% Baseline Rd (W)	25% Fisher Ave (S)
<b>East</b>	20% Heron Rd (E)	20% Heron Rd (E)
<b>West</b>	20% Baseline Rd (W) 5% Fisher Ave (N)	20% Baseline Rd (W) 5% Fisher Ave (N)
<b>Total</b>	<b>100%</b>	<b>100%</b>

Figure 14: New Site Generation Auto Volumes

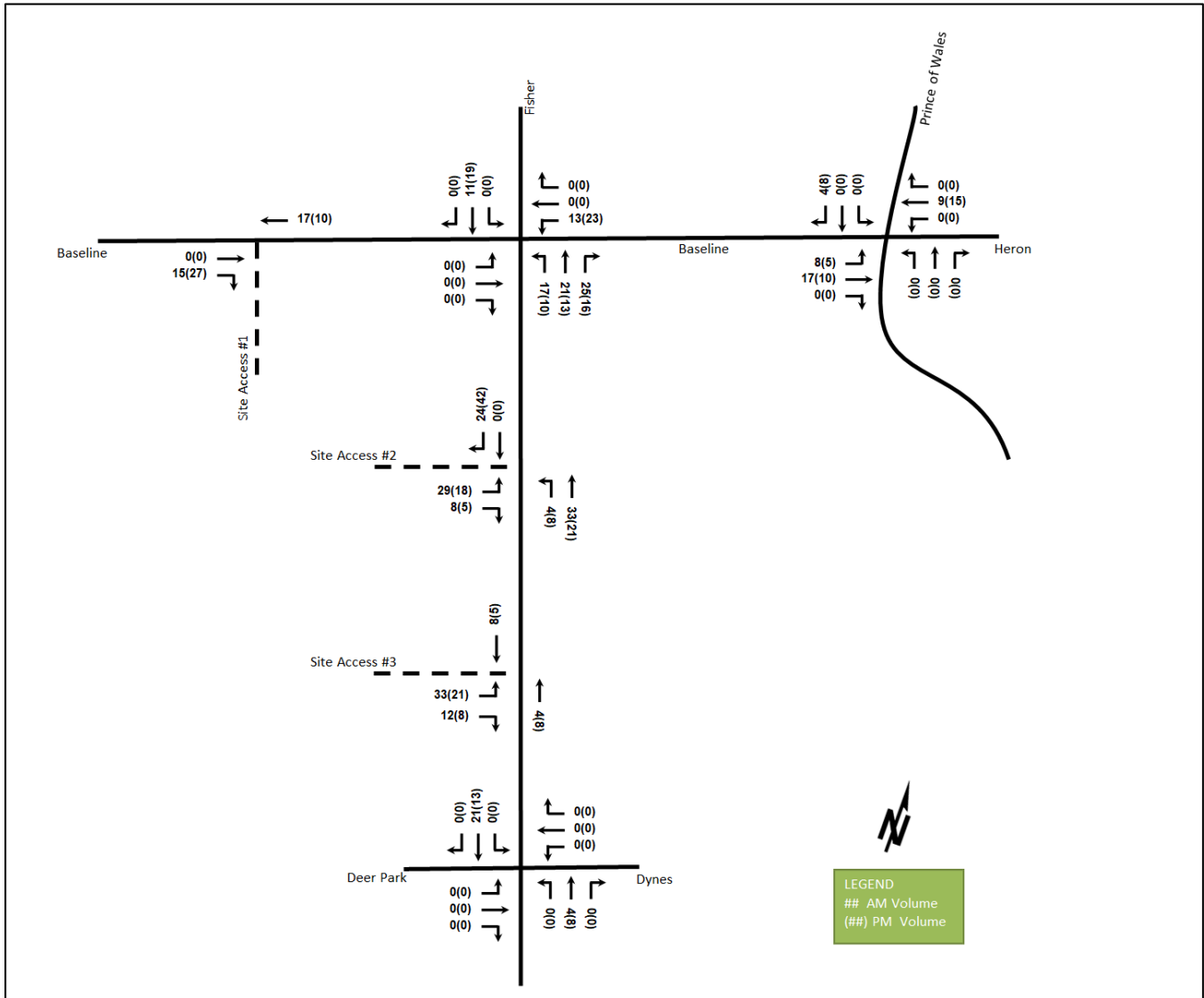
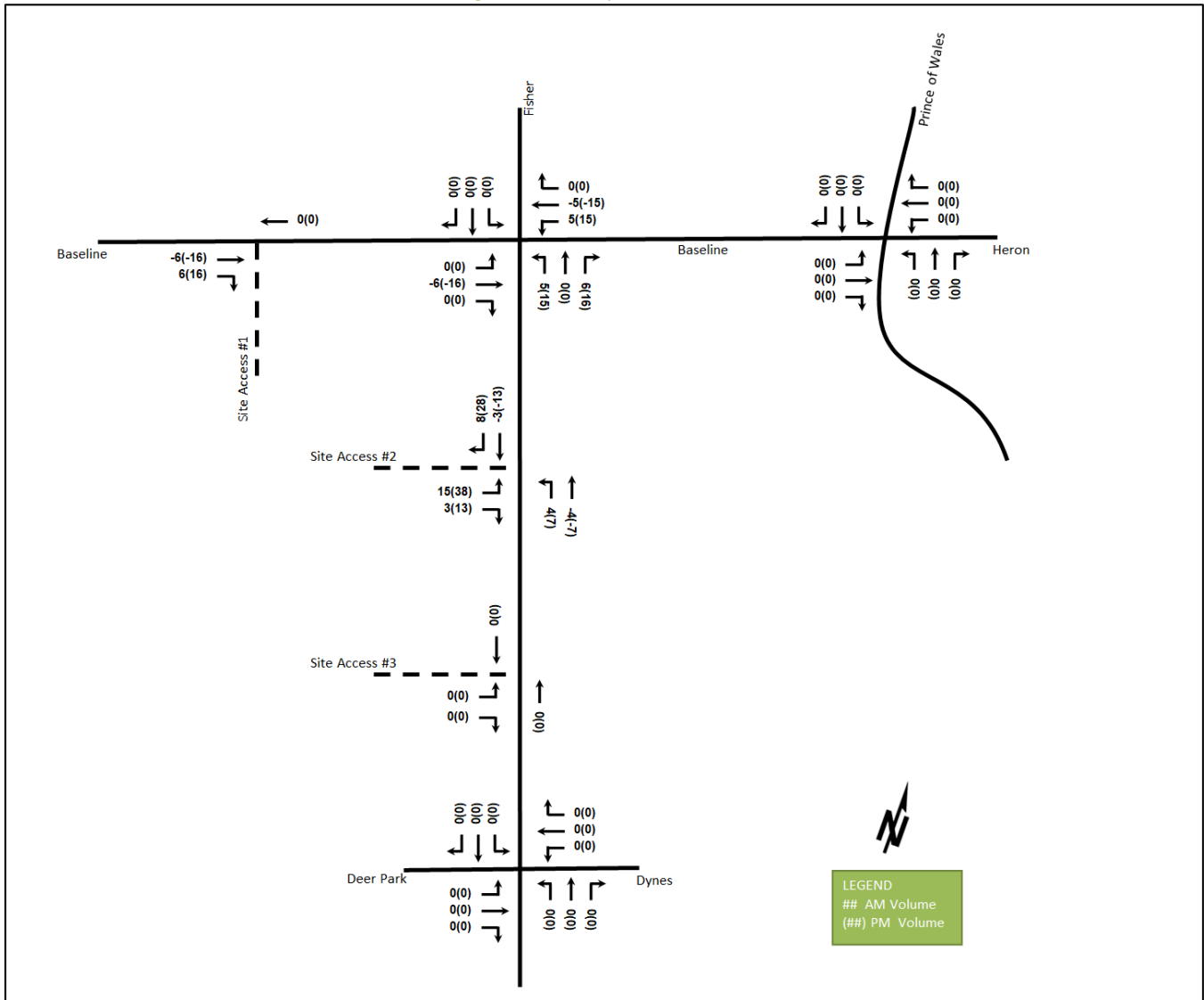




Figure 15: Pass-By Auto Volumes



## 6 Background Network Travel Demands

### 6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. The Baseline Road Rapid Transit Corridor project is the only confirmed project within the study and will be incorporated into the road network analysis. The future geometry is based upon the preliminary detailed design from the Baseline Road Rapid Transit Corridor project for the Baseline Road at Fisher Avenue intersection provided by the City, and the 1111 Prince of Wales Drive TIA (Novatech, 2020) for the intersection of Prince of Wales Drive at Baseline Road/Heron Road. No other improvements impacting the transportation network elements or traffic were noted within the study area.

### 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 each of the study area roadways. The background TRANS model growth rates are summarized in Table 17 and the TRANS model plots are provided in Appendix E.

Table 17: TRANS Regional Model Projections – Study Area Growth Rates

Street	TRANS Rate	
	Eastbound	Westbound
Baseline Road	-0.28%	0.07%
Heron Road	-0.05%	0.41%
	Northbound	Southbound
Prince of Wales Drive	0.77%	0.72%
Fisher Avenue	0.61%	0.12%

The growth rates derived from the 2011 and 2031 TRANS model horizons are projected to be positive in the westbound direction along Baseline Road and Heron Road, and in the northbound and southbound directions along Prince of Wales Drive and Fisher Avenue. Annual growth rates rounded to the nearest 0.25% will be applied to the mainline volumes of the appropriate study area roads in the AM peak hour and reversed in the PM peak hour. Table 18 summarizes the growth rates applied.

Table 18: Study Area Growth Rates Applied

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Baseline Road	-	-	-	-
Heron Road	-	0.50%	0.50%	-
	Northbound	Southbound	Northbound	Southbound
Prince of Wales Drive	0.75%	0.75%	0.75%	0.75%
Fisher Avenue	0.50%	0.25%	0.25%	0.50%

### 6.3 Other Developments

The background developments explicitly considered in the background conditions include 1111 Prince of Wales Drive and these volumes have been provided in Appendix F.

### 6.4 Trip Reductions from Existing Site Land Uses

To account for the removal of the existing commercial strip and associated reductions in the network traffic for the auto trips, an approximation of the existing land uses was derived from the ITE Trip Generation Manual 11th Edition (2017) using the City-prescribed conversion factor of 1.28. Table 19 summarizes the land uses and GFA approximations, and the estimated existing site generated trips by mode have been provided in Appendix G..

Table 19: Trip Generation Person Trip Rates by Peak Hour

Land Use	Land Use Code	GFA (sq. ft.)
High-Turnover (Sit-Down) Restaurant	932 (ITE)	6,954
Convenience store	851 (ITE)	2,573
Bank	911 (ITE)	3,552
Fast Casual Restaurant	930 (ITE)	1,130
Fast-Food Restaurant without Drive-Through Window	933 (ITE)	1,130
Clinic	630 (ITE)	8,547
Hair Salon	918 (ITE)	2,260
Toy/Children's Superstore	864 (ITE)	1,130

The existing site is estimated to produce 83 AM two-way auto trips in the AM peak hour and 92 two-way auto trips in the PM peak hour based on the existing land uses and the recommended area mode shares. Figure 16 illustrates the trip reduction from the existing site and Table 20 compares the estimated existing auto trips and forecasted site-generated auto trips.

Figure 16: Trip Reduction Volumes

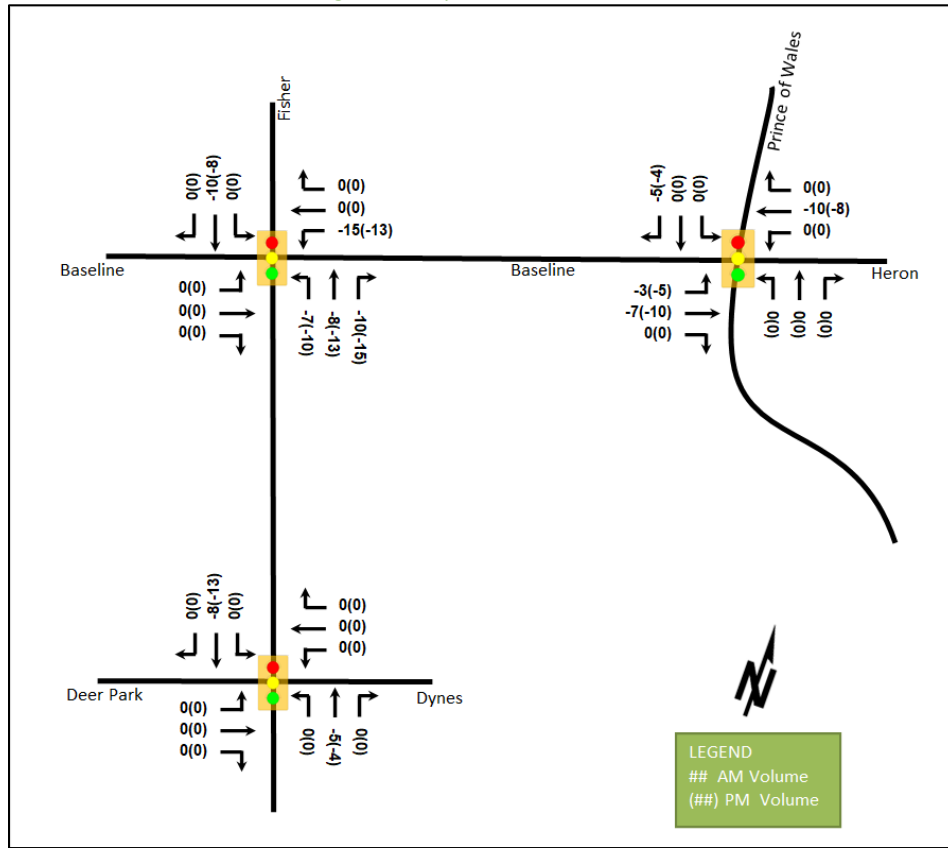


Table 20: Estimated Existing Auto Trip Volumes vs Forecasted Auto Trip Volumes

Scenario	AM Peak Hour				PM Peak Hour			
	Mode Share	In	Out	Total	Mode Share	In	Out	Total
Existing	Varies	50	33	83	Varies	42	50	92
Proposed	Varies	43	83	126	Varies	76	52	128
<b>Difference</b>	-	<b>-7</b>	<b>+50</b>	<b>+43</b>	-	<b>+34</b>	<b>+2</b>	<b>+36</b>

## 7 Demand Rationalization

### 7.1 2034 Future Background Operations

Figure 17 illustrates the 2034 background volumes and Table 21 summarizes the 2034 background intersection operations which include signal timing adjustments for the new intersection approach configurations including the BRT corridor. The Prince of Wales Drive at Baseline Road/Heron Road intersection counts have been factored to remove the detour volumes. 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. The synchro worksheets for the 2034 future background horizon are provided in Appendix H.

Figure 17: 2034 Future Background Volumes

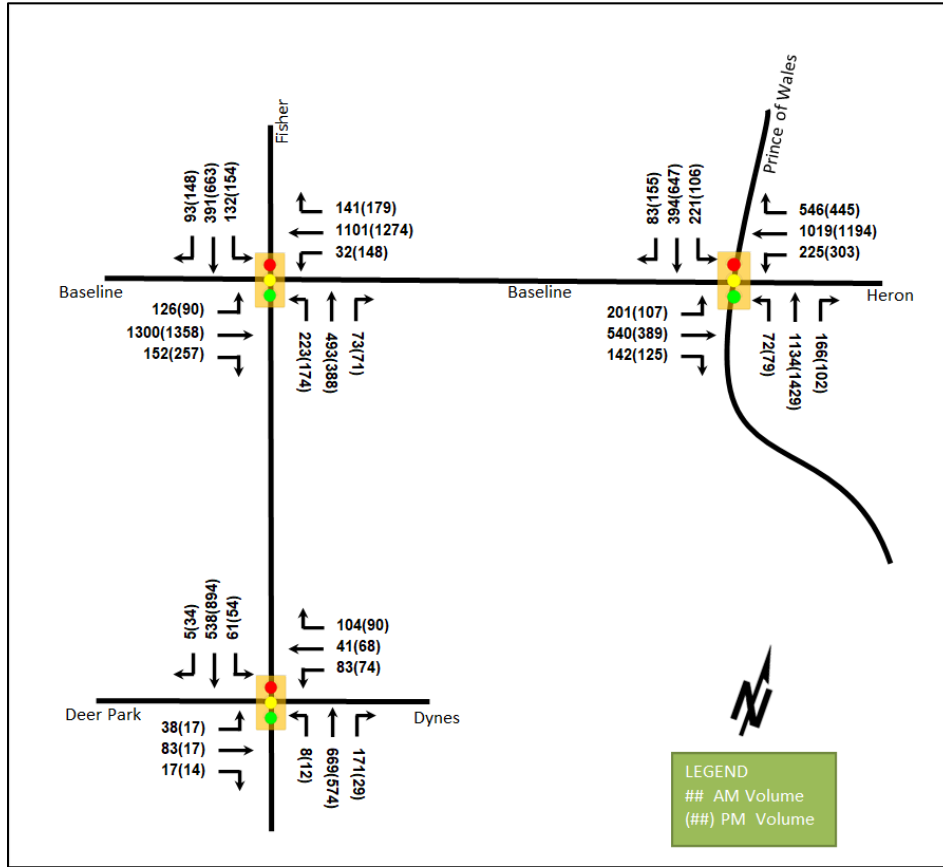


Table 21: 2034 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
Fisher Avenue at Baseline Road Signalized	EBL	C	0.71	78.0	#73.4	E	0.92	131.2	#56.4
	EBT	D	0.89	43.9	#242.4	F	1.14	110.7	#255.3
	EBR	A	0.24	26.9	45.5	A	0.50	36.3	77.1
	WBL	A	0.42	59.0	m10.6	F	1.10	128.7	m#46.8
	WBT	E	0.97	88.0	m#169.6	E	0.99	62.6	m123.1
	WBR	A	0.29	65.4	m40.9	A	0.32	42.2	m33.9
	NBL	E	0.95	102.1	#105.9	F	1.09	151.1	#96.8
	NBT/R	C	0.72	50.5	85.6	A	0.52	42.7	69.6
	SBL	C	0.73	78.9	#55.0	F	1.02	136.1	#84.7
	SBT/R	C	0.73	53.9	74.5	E	0.96	68.8	#146.3
<b>Overall</b>	<b>E</b>	<b>0.92</b>	<b>62.7</b>	-	-	<b>F</b>	<b>1.07</b>	<b>81.7</b>	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
<b>Prince of Wales Drive at Baseline Road/Heron Road</b> <i>Signalized</i>	EBL	<b>F</b>	<b>1.20</b>	<b>156.5</b>	<b>m#82.4</b>	<b>F</b>	<b>1.18</b>	<b>126.9</b>	<b>m#28.5</b>
	EBT/R	D	0.81	69.9	m111.3	D	0.87	63.8	m67.1
	WBL	E	0.95	<b>101.6</b>	<b>#107.1</b>	E	0.98	<b>100.0</b>	<b>#135.5</b>
	WBT	<b>F</b>	<b>1.02</b>	<b>78.7</b>	<b>#186.8</b>	<b>F</b>	<b>1.13</b>	<b>110.9</b>	<b>#228.2</b>
	WBR	<b>F</b>	<b>1.24</b>	<b>165.2</b>	<b>#240.9</b>	E	0.99	<b>83.4</b>	<b>#180.7</b>
	NBL	A	0.53	70.1	32.9	A	0.53	70.1	36.2
	NBT/R	<b>F</b>	<b>1.18</b>	<b>129.8</b>	<b>#252.3</b>	<b>F</b>	<b>1.21</b>	<b>138.8</b>	<b>#294.4</b>
	SBL	<b>F</b>	<b>1.26</b>	<b>204.0</b>	<b>#62.3</b>	D	0.85	<b>110.7</b>	<b>#31.1</b>
	SBT/R	A	0.45	37.3	71.3	C	0.75	44.1	119.8
<b>Overall</b>	<b>F</b>	<b>1.38</b>	<b>107.3</b>	-	<b>F</b>	<b>1.49</b>	<b>100.6</b>	-	
<b>Fisher Avenue at Deer Park Road/Dynes Road</b> <i>Signalized</i>	EB	A	0.40	25.9	29.4	A	0.17	23.6	13.1
	WB	B	0.63	27.5	42.2	C	0.76	45.9	54.7
	NBL/T	B	0.67	16.7	117.4	A	0.52	11.3	93.7
	NBR	A	0.20	2.3	8.2	A	0.03	1.3	2.1
	SB	A	0.38	10.5	39.0	A	0.51	10.1	72.1
	<b>Overall</b>	<b>B</b>	<b>0.64</b>	<b>15.3</b>	-	<b>A</b>	<b>0.57</b>	<b>15.1</b>	-

Saturation flow rate of 1800 veh/h/lane  
 Notes: Queue is measured in metres  
 Peak Hour Factor = 1.00

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

The planned geometric changes at the Baseline Road intersections focus on the development and facilitation of transit service along the corridor and will not directly mitigate auto operational constraints.

At the intersection of Fisher Avenue and Baseline Road, the future geometry and background growth are forecasted to change operations. During the AM peak hour, the eastbound left turn movement is anticipated to exhibit extended queues and the northbound left turn movement may be subject to high delays at this horizon. During the PM peak hour, the eastbound left movement may be subject to high delays and extended queues, the westbound left movement is forecasted to be over theoretical capacity with high delays and extended queues, the northbound left movement is forecasted to be over theoretical capacity and the southbound left movement is forecasted to be over theoretical capacity with high delays.

At the intersection of Prince of Wales Drive and Baseline Road/Heron Road, the geometric changes, background growth, and the reversion to the condition without the detour volumes are anticipated to be associated with operations that are different and improved from the existing horizon. Under these conditions, during the AM peak hour the eastbound left, westbound through, westbound right, northbound through/right and southbound left movements are anticipated to be over capacity with high delays and extended queues, the westbound left movement is anticipated to be subject to high delays and extended queues, and the overall intersection is forecasted to be over theoretical capacity with high delays. During the PM peak hour, the eastbound left, westbound through, and northbound through/right movements are anticipated to be over theoretical capacity with high delays and extended queues, the westbound left, westbound right, and southbound left movements are anticipated to be subject to high delays and extended queues, and the overall intersection is forecasted to be over theoretical capacity with high delays.

The Fisher Avenue and Deer Park Road/Dynes Road intersection is anticipated to continue to operate well.

## 7.2 Demand Rationalization Conclusions

Overall, the proposed development is anticipated to constitute a minor increase in volumes on the study area road network above the existing land uses, as described in Section 6.4, and therefore no rationalization for site traffic is required.

With respect to rationalization of background traffic, after coming online and serving existing demands, it is anticipated that residual trip capacity will be available in the Baseline Road corridor will be available in the form of transit and cycling trips. For the BRT corridor to maintain intersection operations commensurate with the existing conditions, shifts from auto trips to transit trips of 3% of the volumes at the intersection of Fisher Avenue and Baseline Road in the PM peak hour. For the intersection of Prince of Wales Drive at Baseline Road/Heron Road, the intersection is anticipated to be overcapacity with delay and queuing issues in the future even if shifts to transit in area and regional trips are achieved through the construction of the BRT corridor based upon the high regional demand.

## 8 Transportation Demand Management

### 8.1 Context for TDM

The mode shares used within the TIA represent a shift from auto modes to transit and cycling modes. As the future Baseline Road Rapid Transit Corridor project will enhance the cycling connectivity and transit access of the development and result in residual trip capacity for these modes, the increases in these mode shares is likely to be achieved. Supportive TDM measures should be included aimed at ensuring this outcome and encouraging further shifts towards transit.

The subject site is not within a design priority area. Total bedrooms within the development are subject to the unit breakdown. No age restrictions are noted.

### 8.2 Need and Opportunity

The subject site has been assumed to rely on auto travel and transit with an increase in transit and cycling ridership with the immediate proximity to the future BRT corridor, and those assumptions have been carried through the analysis. Risks associated with failing to meet mode share targets may be increased volumes on the existing overcapacity movements at the intersections of Fisher Avenue at Baseline Road and Prince of Wales Drive at Baseline Road/Heron Road. The presence of further operational issues will, however, encourage transit uptake.

### 8.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklist for the residential land uses. The checklist is provided in Appendix I. The key TDM measures recommended to be considered in future site plan applications include:

- Display local area maps with walking and cycling routes, and transit route information and schedules at major entrances
- Provide real-time arrival information display at entrances
- Provide a multimodal travel option information package to new residents
- Contract with providers to install on-site bikeshare (or other micro-mobility, e.g., scootershare)
- Contract with providers to install on-site carshare spaces
- Inclusion of a 1-year Presto card for the initial purchase of condo purchase and/or rental of apartment
- Unbundle parking cost from purchase or rental costs

## 9 Transit

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 22 summarizes the transit trip generation.

Table 22: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	Varies	75	162	237	126	95	221

The proposed development is anticipated to generate 350 AM and 260 PM peak hour two-way transit trips. These transit trips are new trips associated with the residential land use and provided for the purposes of transit service and schedule planning for residential origins and destinations. Transit trips from the existing commercial development are not considered or discounted within this section.

From the trip distribution found in section 5.3, these values can be further broken down. Table 23 summarizes forecasted site-generated transit ridership trips by direction and the equivalent bus loads. It is assumed that trips to the north and south may be taken by connecting to the LRT Trillium Line east of the site via the bus routes.

Table 23: Forecasted Site-Generated Transit Ridership

Direction	AM Peak Hour		PM Peak Hour		Service Type	Equivalent Service Increase
	In	Out	In	Out		
North	20	43	34	25	Bus, BRT (future)	Half standard bus load
South	17	35	28	21		Half standard bus load
East	13	28	23	16		Half standard bus load
West	17	35	28	21		Two-thirds standard bus load

### 9.1 Transit Priority

Examining the study area intersection operations, negligible impacts on delay are anticipated on transit movements at the study area intersections as a result of the development site traffic. No additional transit priority measures are required for Baseline Road beyond those being implemented through the EA. Presently, no transit turning movements exist between Baseline Road and the isolated transit priority corridor on Fisher Avenue.

## 10 Network Intersection Design

### 10.1 Network Intersection Control

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

### 10.2 Network Intersection Design

#### 10.2.1 2034 Future Total Operations

Figure 18 illustrates the 2034 total volumes and Table 24 summarizes the 2034 total intersection operations including signal timing adjustments as in the background conditions. 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. The synchro worksheets for the 2034 total horizon are provided in Appendix J.

Figure 18: 2034 Future Total Volumes

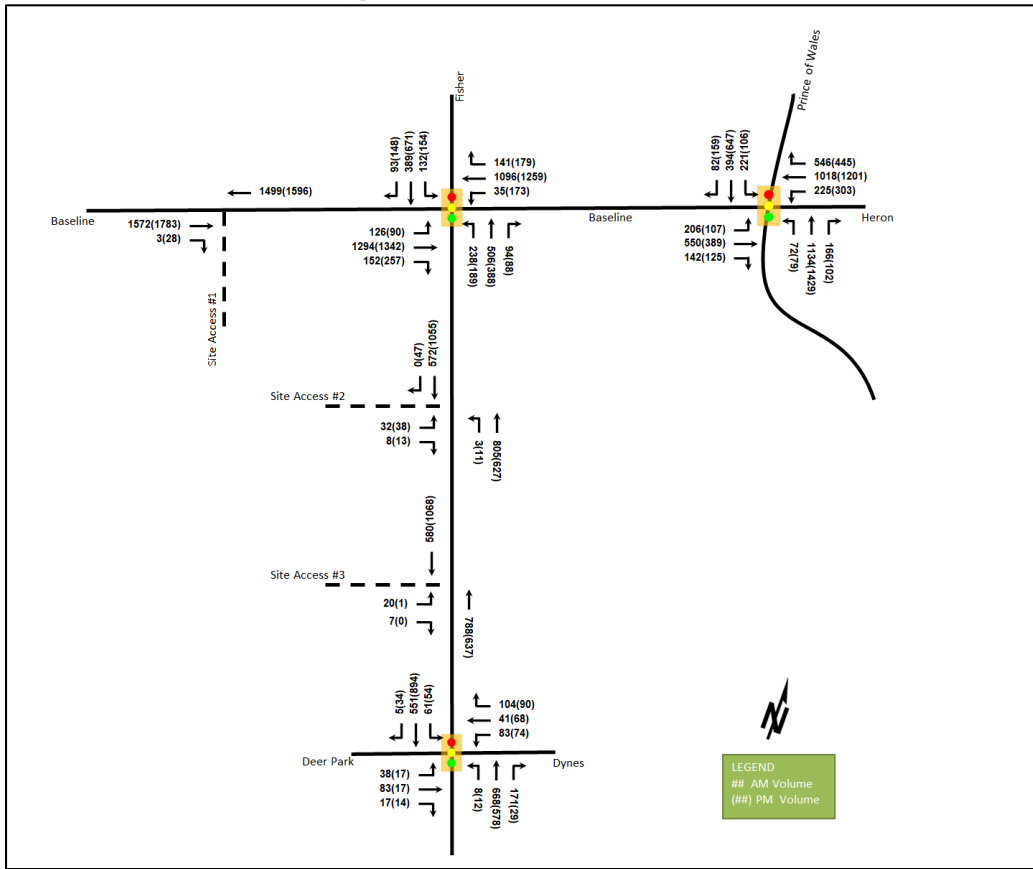


Table 24: 2034 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
Fisher Avenue at Baseline Road Signalized	EBL	C	0.71	78.2	#73.4	E	0.92	131.2	#56.4
	EBT	E	0.94	51.2	#240.7	F	1.12	105.7	#250.8
	EBR	A	0.32	30.2	47.8	B	0.62	41.9	84.0
	WBL	A	0.44	59.7	m11.2	F	1.28	191.3	m#59.6
	WBT	E	0.98	88.7	m#168.4	E	0.98	60.0	m121.3
	WBR	A	0.29	65.8	m41.2	A	0.33	42.2	m33.6
	NBL	F	1.01	116.9	#115.5	F	1.22	190.4	#106.4
	NBT/R	C	0.77	52.1	91.5	A	0.55	43.3	72.5
	SBL	C	0.73	78.9	#55.0	F	1.02	136.1	#84.7
	SBT/R	C	0.73	53.6	74.4	E	0.97	71.0	#149.8
<b>Overall</b>	<b>E</b>	<b>0.95</b>	<b>66.2</b>	-	<b>F</b>	<b>1.10</b>	<b>84.3</b>	-	



Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
<b>Prince of Wales Drive at Baseline Road/Heron Road</b> <i>Signalized</i>	EBL	<b>F</b>	<b>1.23</b>	<b>163.7</b>	<b>m#80.0</b>	<b>F</b>	<b>1.18</b>	<b>127.4</b>	<b>m#29.5</b>
	EBT/R	D	0.83	72.6	m108.3	D	0.88	63.5	m68.1
	WBL	E	0.95	<b>101.6</b>	<b>#107.1</b>	E	0.98	<b>100.0</b>	<b>#135.5</b>
	WBT	<b>F</b>	<b>1.02</b>	<b>78.5</b>	<b>#186.6</b>	<b>F</b>	<b>1.14</b>	<b>113.3</b>	<b>#230.1</b>
	WBR	<b>F</b>	<b>1.24</b>	<b>166.3</b>	<b>#241.3</b>	E	0.99	<b>85.2</b>	<b>#181.3</b>
	NBL	A	0.53	70.1	32.9	A	0.53	70.1	36.2
	NBT/R	<b>F</b>	<b>1.18</b>	<b>129.8</b>	<b>#252.3</b>	<b>F</b>	<b>1.21</b>	<b>138.8</b>	<b>#294.4</b>
	SBL	<b>F</b>	<b>1.26</b>	<b>204.0</b>	<b>#62.3</b>	D	0.85	<b>110.7</b>	<b>#31.1</b>
	SBT/R	A	0.45	37.2	71.3	C	0.76	44.3	120.9
<b>Overall</b>	<b>F</b>	<b>1.22</b>	<b>108.1</b>	-	<b>F</b>	<b>1.19</b>	<b>101.4</b>	-	
<b>Fisher Avenue at Deer Park Road/Dynes Road</b> <i>Signalized</i>	EB	A	0.40	25.7	29.0	A	0.17	23.4	13.2
	WB	B	0.65	28.3	42.2	C	0.78	47.5	55.5
	NBL/T	B	0.67	17.0	120.2	A	0.53	11.6	94.4
	NBR	A	0.21	2.4	8.4	A	0.03	1.3	2.1
	SB	A	0.39	10.7	41.0	A	0.52	10.4	72.2
	<b>Overall</b>	<b>B</b>	<b>0.65</b>	<b>15.6</b>	-	<b>A</b>	<b>0.58</b>	<b>15.5</b>	-

Saturation flow rate of 1800 veh/h/lane  
 Notes: Queue is measured in metres  
 Peak Hour Factor = 1.00

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

The study area intersections at the 2034 future total horizon will operate similarly to the 2034 background conditions except for the northbound left-turn movement at Fisher Avenue and Baseline Road intersection during AM peak hour, which will be over theoretical capacity with high delays and extended queues.

A network reduction of approximately two northbound left-turn vehicles would reduce the v/c of this movement to 1.00 or below.

10.2.2 2034 Future Total Operations – Sensitivity Without Baseline Rapid Transit

The City requested a sensitivity analysis of the site buildout without the Baseline Rapid Transit corridor having been implemented. As no reduction in area traffic has been assumed within this report as a result of this implementation, the resultant change will be to the transit mode share target for site traffic. The existing recommended district mode shares by land use for Merivale, which is summarized in Table 9, have been used, resulting in a 12% increase in auto modes for residential and a 10% increase in auto modes for commercial above the targets with the BRT improvements. Table 25 summarizes the total trip generation without Baseline Rapid Transit.

Table 25: Trip Generation by Mode – Without Baseline Rapid Transit

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (High-Rise)	Auto Driver	41%	49	113	162	41%	95	68	163
	Auto Passenger	6%	7	16	23	11%	25	18	43
	Transit	42%	58	128	186	33%	81	59	110
	Cycling	2%	4	7	11	2%	5	4	9
	Walking	8%	12	26	38	13%	35	25	60
	<b>Total</b>	<b>100%</b>	<b>130</b>	<b>290</b>	<b>420</b>	<b>100%</b>	<b>241</b>	<b>174</b>	<b>415</b>
Retail (<40k sq. ft.)	Auto Driver	71%	13	9	22	61%	22	14	36
	Auto Passenger	19%	9	6	15	16%	19	17	36
	Transit	1%	0	1	1	8%	9	9	18
	Cycling	0%	0	0	0	1%	1	1	2
	Walking	9%	4	3	7	14%	17	15	32
	Pass-by	40%	-22	-14	-36	40%	-51	-51	-102
	Internal Capture	varies	-6	-3	-9	varies	-8	-20	-28
	<b>Total</b>	<b>100%</b>	<b>26</b>	<b>19</b>	<b>45</b>	<b>100%</b>	<b>68</b>	<b>56</b>	<b>124</b>
Total	Auto Driver	-	62	122	184	-	117	82	199
	Auto Passenger	-	16	22	38	-	44	35	79
	Transit	-	58	129	187	-	90	68	128
	Cycling	-	4	7	11	-	6	5	11
	Walking	-	16	29	45	-	52	40	92
	<b>Total</b>	-	<b>156</b>	<b>309</b>	<b>465</b>	-	<b>309</b>	<b>230</b>	<b>539</b>

As shown above, a total of 184 AM and 199 PM new peak hour two-way vehicle trips are projected as a result of the proposed development. Table 26 summarizes the auto trip generation comparison between the scenarios without Baseline Rapid Transit and with Baseline Rapid Transit.

Table 26: Proposed Site Generation Vehicle Trip Volumes Without BRT vs Proposed Site Generation Vehicle Trip Volumes With BRT

Scenario	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
With BRT	43	83	126	76	52	128
Without BRT	62	122	184	117	82	199
<b>Difference</b>	<b>+19</b>	<b>+39</b>	<b>+58</b>	<b>+41</b>	<b>+30</b>	<b>+70</b>

Figure 19 illustrates the 2034 total volumes at Fisher Avenue at Baseline Road intersection without the Baseline Rapid Transit Corridor project having been implemented and Table 27 summarizes the 2034 future total operations at Fisher Avenue at Baseline Road intersection under this scenario. 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. The synchro worksheets for the 2034 future total horizon at Fisher Avenue at Baseline Road without Baseline Rapid Transit are provided in Appendix K.

Figure 19: 2034 Future Total Volumes – Fisher Avenue at Baseline Road Without Baseline Rapid Transit

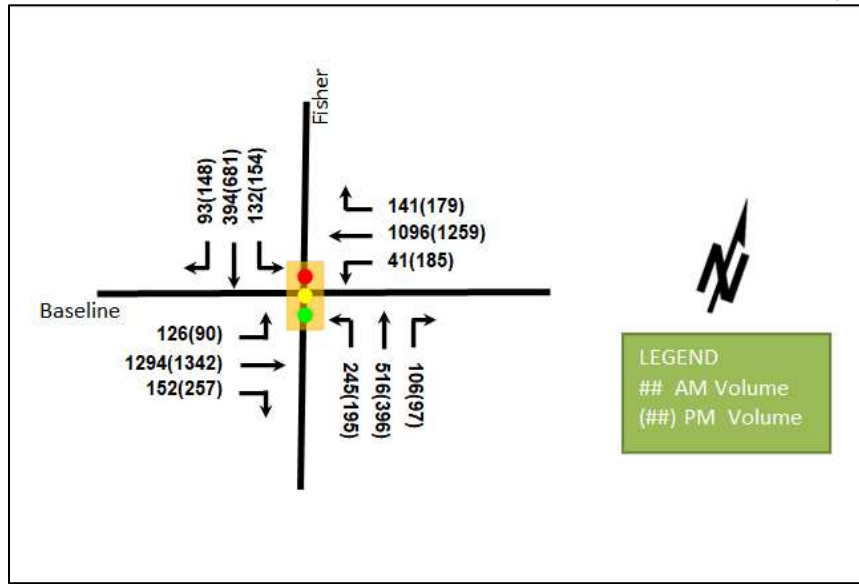


Table 27: 2034 Future Total Intersection Operations– Fisher Avenue at Baseline Road Without Baseline Rapid Transit

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )	LOS	V/C	Delay (s)	Q (95 <sup>th</sup> )
Fisher Avenue at Baseline Road Signalized	EBL	B	0.67	71.5	50.4	A	0.60	72.6	39.5
	EBT	D	0.90	45.1	#229.9	F	1.11	100.9	#249.1
	EBR	A	0.21	2.7	8.6	A	0.43	17.5	47.3
	WBL	A	0.47	82.9	m6.3	E	0.94	107.1	#95.9
	WBT	E	0.93	29.1	m97.3	E	0.96	55.3	#223.8
	WBR	A	0.21	9.0	m10.4	A	0.27	7.3	19.8
	NBL	D	0.85	77.8	#97.9	D	0.86	86.7	#87.4
	NBT	C	0.72	52.6	82.0	A	0.59	51.5	66.7
	NBR	A	0.23	1.2	0.0	A	0.25	4.7	7.6
	SBL	C	0.71	76.5	53.7	C	0.75	77.2	60.8
	SBT	C	0.77	62.5	67.1	F	1.10	115.7	#141.8
	SBR	A	0.22	1.2	0.0	A	0.40	14.0	23.0
<b>Overall</b>	<b>D</b>	<b>0.89</b>	<b>42.8</b>	-	<b>F</b>	<b>1.05</b>	<b>73.8</b>	-	

Notes: Saturation flow rate of 1800 veh/h/lane  
 Queue is measured in metres  
 Peak Hour Factor = 1.00

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

Without Baseline BRT, Fisher Avenue at Baseline Road at the 2034 future total horizon operate similarly to the existing conditions. While it may be counterintuitive that road improvements would reduce the intersection capacity, the addition of the BRT and geometric requirements for this facility will be a trade off on auto modes for transit. Similarly, protected pedestrian and cycling movements that have been incorporated into the design will also reduce intersection operations. The results of these trade-offs are the existing conditions will indicate that the proposed redevelopment can be better supported than once the BRT is constructed and auto capacity reductions inflate potential operational constraints, some in an exaggerated fashion.

With respect to other TIA conclusions of which the City requested re-examination as part of the subject sensitivity analysis, no reduction in transit MMLOS is noted on any approach at the intersection of Fisher Avenue at Baseline Road between this scenario and the existing conditions, and no intersection design elements would be required to support the development.

10.2.3 Network Intersection MMLOS

Table 28 summarizes the MMLOS analysis for the network intersections within the study area. The existing and future conditions for both intersections will be the same and are considered in one row. The intersection analysis of Fisher Avenue at Baseline Road and Prince of Wales Drive at Baseline Road/Heron Road are based on the policy area within 600 metres of a rapid transit station, and Fisher Avenue at Deer Park Road/Dynes Road is based on the policy area of within 300 metres of a school. The MMLOS worksheets has been provided in Appendix L.

Table 28: Study Area Intersection MMLOS Analysis

Intersection	Horizon	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
		PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Fisher Ave at Baseline Rd	Existing	F	A	F	A	F	A	A	D	F	E
	Future	F	A	A	A	F	A	A	D	F	E
Prince of Wales Dr at Baseline Rd/ Heron Rd	Existing	F	A	F	A	F	A	A	D	F	E
	Future	F	A	A	A	F	A	A	D	F	E
Fisher Ave at Deer Park Rd/ Dynes Rd	Existing /Future	E	A	A	B	C	D	-	-	B	E

The pedestrian LOS will not be met at the intersections throughout the study area. As is typical for arterial roads, the crossing distances do not permit the targets to be met. To meet pedestrian LOS targets, the maximum crossing distance on all pedestrian crossings would need to be reduced to two lane-widths.

The bicycle LOS will not be met at the existing intersections of Fisher Avenue at Baseline Road and Prince of Wales Drive at Baseline Road/Heron Road, but it will be met once the planned modifications are completed.

The transit LOS will not be met at the intersections throughout the study area except for Fisher Avenue at Deer Park Road/Dynes Road intersection. To meet transit LOS, the delay would need to be reduced to zero seconds on all transit movements. The future Baseline Road Rapid Transit Corridor is anticipated to improve the eastbound and westbound operations, but the northbound and southbound movements will not meet the transit LOS.

The auto LOS will not be met throughout the study area except for Fisher Avenue at Deer Park Road/Dynes Road intersection.

The MMLOS scores for the future conditions are highlighted for the City’s review given their planned improvements for these intersections, and meeting these targets are not considered the responsibility of the developer.

10.2.4 Recommended Design Elements

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

11 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 site includes three mixed-use buildings with a total of 998 dwelling units and 30,044 sq. ft of commercial space
- The first phase of development is to include the construction of the southern building in the location of an existing parking lot, and the remaining phases are to involve the demolition of the strip retail plaza

- The development proposes the use of an existing right-in-only access on Baseline Road, an existing full-movements access, and a newly proposed outbound access on Fisher Avenue
- The development is proposed to be completed across multiple phases in 2034
- The trip generation, location, and safety triggers were met for the TIA Screening
- This report accompanies an Official Plan amendment and zoning by-law amendment

### Existing Conditions

- Baseline Road, Heron Road, Fisher Avenue, Prince of Wales Drive are arterial roads in the study area, and Deer Park Road and Dynes Road are collector roads
- Sidewalks are provided along the south side of Baseline Road and of Deer Park Road west of Millbrook Crescent, on the east side of Prince of Wales Drive, on the west side of Fisher Avenue north of Baseline Road, on both sides of Fisher Avenue south of Baseline Road, Dynes Road, and Deer Park Road east of Millbrook Crescent
- A paved shoulder is present on both sides of Fisher Avenue except through the intersection with Baseline Avenue where bike lanes are present and on Fisher Avenue of the road between Malibu Terrace and the auxiliary northbound right turn lane taper at Baseline Road where a cycletrack is present
- Cycletracks are also present at the Fisher Avenue at Deer Park Road/Dynes Road intersection, and bike lanes are present along Dynes Road
- Fisher Avenue, Prince of Wales Drive, Baseline Road, and Heron Road are spine routes, and Baseline Road, Heron Road and Prince of Wales Drive are cross-town bikeways
- Malibu Terrace west of Fisher Avenue, Hilliard Avenue north of Malibu Terrace, Sunnycrest Drive, Deer Park Road, Dynes Road, and McCooey Lane are local routes
- The high volumes roadways have produced a high number of collisions at the study area intersections, primarily at the Fisher Avenue at Baseline Road intersection
- The Fisher Avenue at Baseline Road intersection had an angle collision involving a fatality where a pedestrian was killed as a result of a two-vehicle collision, but the remaining collisions are largely associated with congestion
- The study area intersections of Fisher Avenue at Baseline Road and of Prince of Wales Drive at Baseline Road/Heron Road experience capacity issues and significant delay and queuing during both peak hours
- Existing volumes were noted to include detour volumes from the closure of the Hog's Back Bridge

### Development Generated Travel Demand

- The proposed development is forecasted produce 465 two-way person trips during the AM peak hour and 539 two-way person trips during the PM peak hour
- The proposed development is forecasted produce 126 two-way vehicle trips during the AM peak hour and 128 two-way vehicle trips during the PM peak hour based upon an increase in transit and cycling from the typical district mode shares given the proximity of the Baseline BRT improvements
- Of the forecasted trips, 30% are anticipated to travel north, 25% to the south and the west, and 20% to the east

### Background Conditions

- In addition to accounting for changes in volumes from the background developments, the annual background growth derived from the two TRANS model horizons was rounded to the nearest 0.25% and applied in the AM peak hour and reversed in the PM peak hour

- Changes from the Baseline Road Rapid Transit Corridor project are included in future horizons and volumes at the intersection of Prince of Wales Drive and Baseline Road/Heron Road have been factored to remove the detour volumes
- The existing site comprises a 3,247 m<sup>2</sup> of commercial building and is estimated to produce 83 AM two-way auto trips in the AM peak hour and 92 two-way auto trips in the PM peak hour based on the existing land uses and the recommended area mode shares
- The planned geometric changes at the Baseline Road intersections are not anticipated to directly mitigate operational issues, which are anticipated to persist at the 2034 future background horizon
- Operational improvements are noted at the intersection of Prince of Wales Drive and Baseline Road/Heron Road where the detour volumes are not included

#### **Demand Rationalization**

- After construction, residual trip capacity will be available via the Baseline BRT corridor for the transit and cycling modes
- To maintain operations at a similar performance to the existing conditions, a reduction in auto traffic of 3% is required at the intersection of Fisher Avenue at Baseline Road via a shift in auto traffic to transit
- Given the high regional demand, capacity issues are anticipated to persist despite shifts from auto to transit at the intersection of Prince of Wales Drive and Baseline Road/Heron Road

#### **TDM**

- A TDM program should be employed to utilize the added trip capacity from the BRT corridor improvements
- Supportive TDM measures to be included within the proposed development should include:
  - Display local area maps with walking and cycling routes, and transit route information and schedules at major entrances
  - Provide a multimodal travel option information package to new residents
  - Contract with providers to install on-site bikeshare (or other micro-mobility, e.g., scootershare)
  - Contract with providers to install on-site carshare spaces
  - Inclusion of a 1-year Presto card for the initial purchase of condo purchase and/or rental of apartment
  - Unbundle parking cost from purchase or rental costs

#### **Transit**

- The forecasted transit trips will include 237 two-way trips during the AM peak and 221 two-way trips during the PM peak, and these transit trips are new trips associated with the residential land use and provided for the purposes of transit service and schedule planning for residential origins and destinations
- It is assumed that trips to the north and south may be taken by connecting to the LRT Trillium Line east of the site via the bus routes
- Peak hour transit ridership resulting from the site equate to half standard bus load northerly and southerly of the site, and two thirds of a bus load easterly and westerly of the site
- Negligible impacts are anticipated on transit movement delays at the study area intersections from the subject development and no additional transit priority measures are required for Baseline Road beyond those being implemented through the EA

- Presently, no transit turning movements exist between Baseline Road and the isolated transit priority corridor on Fisher Avenue

### Network Intersection Design

- The future total operations are similar to the future background operation and the traffic impacts from the redevelopment are anticipated to be negligible
- A sensitivity analysis for the future conditions without the Baseline BRT implementation concluded that the traffic conditions were improved from the conditions with the improvements given the changes in geometry and signals to support the median BRT impacted network performance
- No change in transit MMLOS is noted on any approach at the intersection of Fisher Avenue at Baseline Road between the scenario without Baseline BRT from the existing conditions, and no intersection design elements would be required to support the development in this scenario
- The pedestrian, transit, and auto LOS will not be met at the intersections of Fisher Avenue at Baseline Road and Prince of Wales Drive at Baseline Road/Heron Road in the existing or future conditions
- The bicycle LOS at the future intersections of Fisher Avenue at Baseline Road and Prince of Wales Drive at Baseline Road/Heron Road will be met but are not met in the existing conditions, and the pedestrian LOS will not be met at the intersection of Fisher Avenue at Deer Park Road/Dynes Road
- The MMLOS scores for the future conditions are highlighted for the City's review given their planned improvements for these intersections, and meeting these targets are not considered the responsibility of the developer

## 12 Conclusion

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

Prepared By:



Yu-Chu Chen, 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: 25-Feb-22  
Project Number: 2021-083  
Project Reference: 780 Baseline Road

1.1 Description of Proposed Development	
Municipal Address	780 Baseline Road
Description of Location	Ward 9. 1.36 ha parcel area on south side of Baseline Rd and West side of Fisher Ave
Land Use Classification	General Mixed Use (GM)
Development Size	900 residential units and approximately 25,000 sq.ft commercial space
Accesses	One on Baseline Road, Two on Fisher Avenue
Phase of Development	Two
Buildout Year	2027
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Townhomes or apartments
Development Size	900 Units
Trip Generation Trigger	Yes

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

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

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


City Of Ottawa  
Infrastructure Services and Community  
Sustainability  
Planning and Growth Management  
110 Laurier Avenue West, 4th fl.  
Ottawa, ON K1P 1J1  
Tel. : 613-580-2424  
Fax: 613-560-6006

Ville d'Ottawa  
Services d'infrastructure et Viabilité des  
collectivités  
Urbanisme et Gestion de la croissance  
110, avenue Laurier Ouest  
Ottawa (Ontario) K1P 1J1  
Tél. : 613-580-2424  
Télécopieur: 613-560-6006

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

Name: Andrew Harte  
(Please Print)

Professional Title: Professional Engineer

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

<b>Office Contact Information (Please Print)</b>
Address: 6 Plaza Court
City / Postal Code: Ottawa / K2H 7W1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com



# Appendix B

Turning Movement Counts



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BASELINE RD @ FISHER AVE

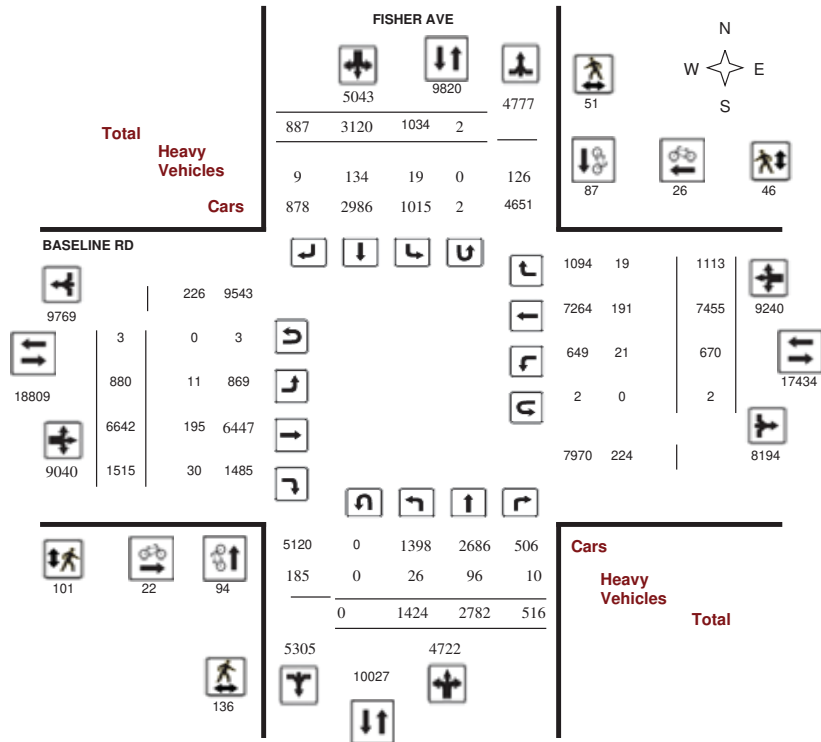
Survey Date: Wednesday, August 03, 2016

WO No: 36121

Start Time: 07:00

Device: Miovision

#### Full Study Diagram



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BASELINE RD @ FISHER AVE

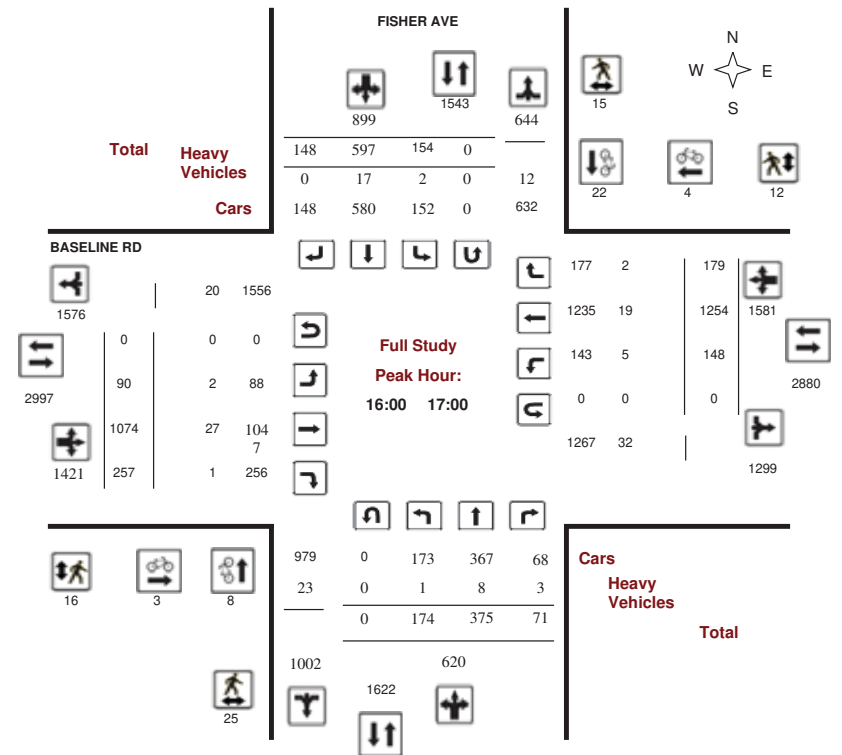
Survey Date: Wednesday, August 03, 2016

WO No: 36121

Start Time: 07:00

Device: Miovision

#### Full Study Peak Hour Diagram





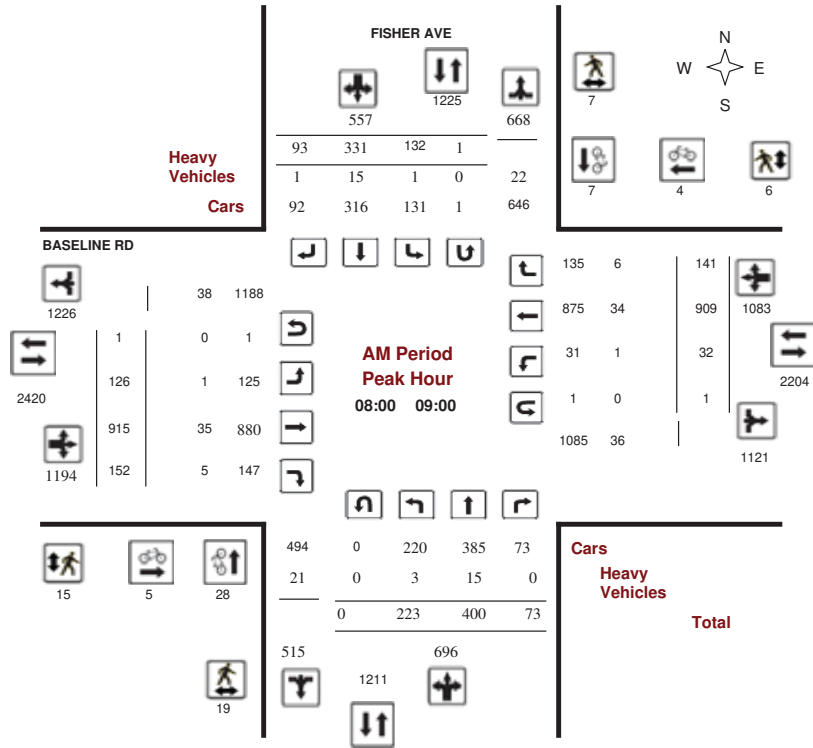
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

### BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016  
Start Time: 07:00

WO No: 36121  
Device: Miovision



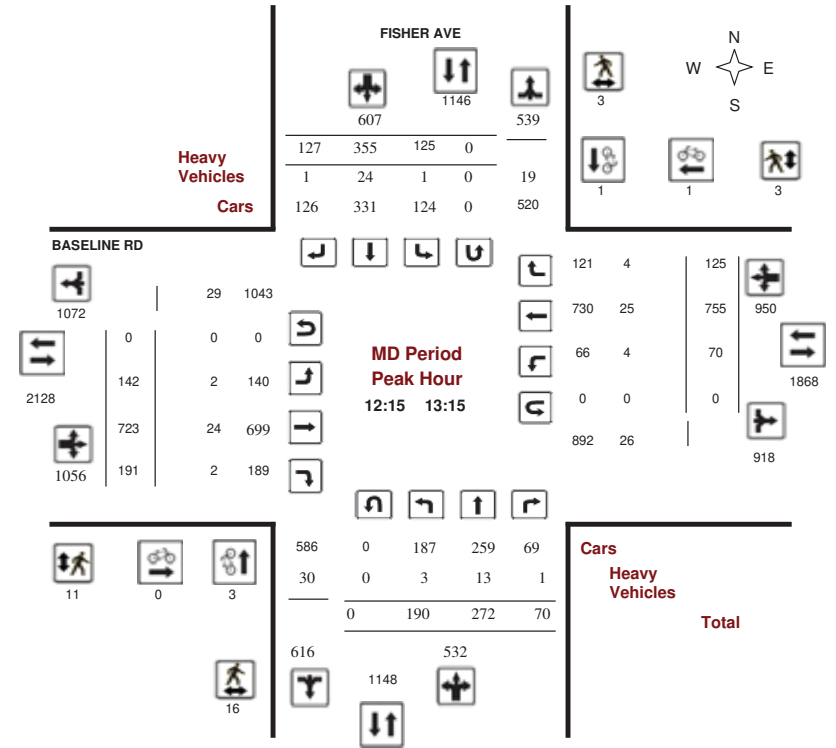
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

### BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016  
Start Time: 07:00

WO No: 36121  
Device: Miovision





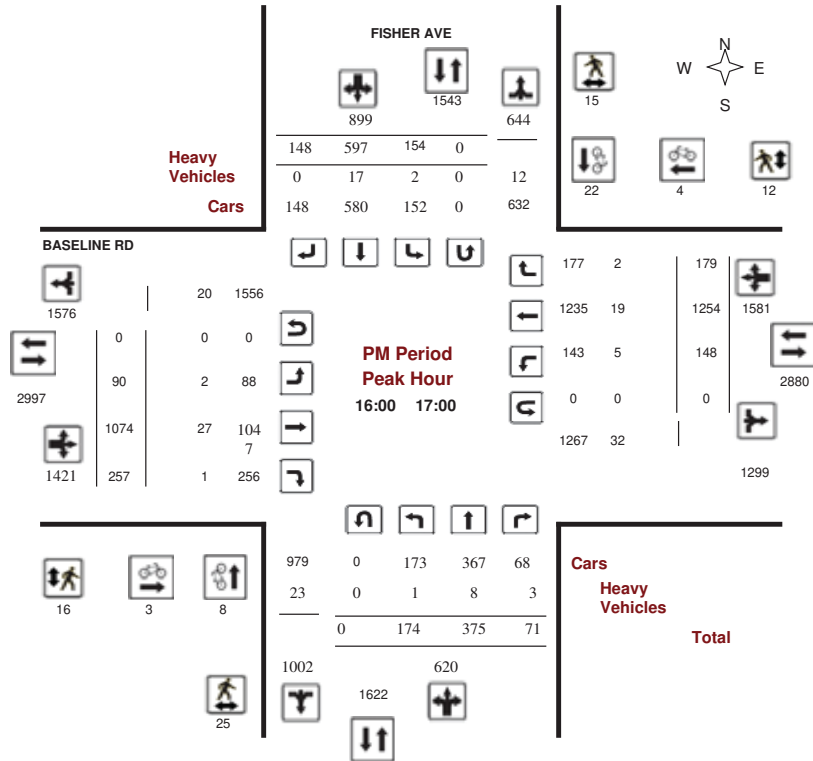
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

### BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016  
Start Time: 07:00

WO No: 36121  
Device: Miovision



Comments



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016  
Start Time: 07:00

WO No: 36121  
Device: Miovision

### Full Study Summary (8 HR Standard)

Survey Date: Wednesday, August 03, 2016

**Total Observed U-Turns**  
Northbound: 0 Southbound: 2  
Eastbound: 3 Westbound: 2

**AADT Factor**  
.90

Period	FISHER AVE								BASELINE RD								WB TOT	STR TOT	Grand Total
	Northbound				Southbound				Eastbound				Westbound						
	LT	ST	RT	TOT	LT	ST	RT	TOT	STR TOT	LT	ST	RT	TOT	LT	ST	RT			
07:00-08:00	174	406	68	648	121	309	57	487	1135	104	835	106	1045	36	702	105	843	1888	3023
08:00-09:00	223	400	73	696	132	331	93	556	1252	126	915	152	1193	32	909	141	1082	2275	3527
09:00-10:00	172	343	55	570	121	269	96	486	1056	70	670	151	891	58	685	120	863	1754	2810
11:30-12:30	172	276	59	507	121	365	135	621	1128	128	658	187	973	71	802	123	996	1969	3097
12:30-13:30	168	283	68	519	108	337	124	569	1088	139	707	211	1057	71	718	125	914	1971	3059
15:00-16:00	153	345	52	550	128	442	120	690	1240	115	848	212	1175	113	1179	173	1465	2640	3880
16:00-17:00	174	375	71	620	154	597	148	899	1519	90	1074	257	1421	148	1254	179	1581	3002	4521
17:00-18:00	188	354	70	612	149	470	114	733	1345	108	935	239	1282	141	1206	147	1494	2776	4121
<b>Sub Total</b>	<b>1424</b>	<b>2782</b>	<b>516</b>	<b>4722</b>	<b>1034</b>	<b>3120</b>	<b>887</b>	<b>5041</b>	<b>9763</b>	<b>880</b>	<b>6642</b>	<b>1515</b>	<b>9037</b>	<b>670</b>	<b>7455</b>	<b>1113</b>	<b>9238</b>	<b>18275</b>	<b>28038</b>
<b>U Turns</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>7</b>
<b>Total</b>	<b>1424</b>	<b>2782</b>	<b>516</b>	<b>4722</b>	<b>1036</b>	<b>3120</b>	<b>887</b>	<b>5043</b>	<b>9765</b>	<b>883</b>	<b>6642</b>	<b>1515</b>	<b>9040</b>	<b>672</b>	<b>7455</b>	<b>1113</b>	<b>9240</b>	<b>18280</b>	<b>28045</b>
EQ 12hr	1979	3867	717	6563	1440	4337	1233	7010	13573	1227	9232	2106	12565	934	10362	1547	12843	25408	38981
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																	<b>1.39</b>		
AVG 12hr	1781	3480	645	5906	1296	3903	1110	6309	12215	1104	8309	1895	11308	841	9326	1392	11559	22867	35082
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																	<b>.90</b>		
AVG 24hr	2333	4559	845	7737	1698	5113	1454	8265	16002	1446	10885	2482	14813	1102	12217	1824	15143	29956	45958
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																	<b>1.31</b>		
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																			



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016

WO No: 36121

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

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

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016

WO No: 36121

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

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





# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016

WO No: 36121

Start Time: 07:00

Device: Miovision

### Full Study Pedestrian Volume

Time Period	FISHER AVE		Total	BASELINE RD		Total	Grand Total
	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)		EB Approach (N or S Crossing)	WB Approach (N or S Crossing)		
07:00 07:15	6	3	9	5	3	8	17
07:15 07:30	2	2	4	3	3	6	10
07:30 07:45	5	1	6	3	3	6	12
07:45 08:00	4	2	6	4	2	6	12
08:00 08:15	3	1	4	4	1	5	9
08:15 08:30	5	3	8	3	3	6	14
08:30 08:45	3	2	5	4	1	5	10
08:45 09:00	8	1	9	4	1	5	14
09:00 09:15	0	1	1	2	1	3	4
09:15 09:30	3	1	4	3	2	5	9
09:30 09:45	0	1	1	1	1	2	3
09:45 10:00	1	0	1	1	1	2	3
11:30 11:45	1	1	2	1	1	2	4
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	1	0	1	1	1	2	3
12:15 12:30	4	0	4	2	1	3	7
12:30 12:45	5	0	5	3	0	3	8
12:45 13:00	2	2	4	3	2	5	9
13:00 13:15	5	1	6	3	0	3	9
13:15 13:30	3	1	4	2	0	2	6
15:00 15:15	5	0	5	8	0	8	13
15:15 15:30	0	3	3	2	1	3	6
15:30 15:45	3	3	6	1	1	2	8
15:45 16:00	15	0	15	4	1	5	20
16:00 16:15	6	10	16	6	4	10	26
16:15 16:30	7	1	8	1	0	1	9
16:30 16:45	9	3	12	3	4	7	19
16:45 17:00	3	1	4	6	4	10	14
17:00 17:15	8	2	10	5	1	6	16
17:15 17:30	10	2	12	4	0	4	16
17:30 17:45	5	2	7	6	2	8	15
17:45 18:00	4	1	5	3	1	4	9
Total .....	136	51	187	101	46	147	334



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016

WO No: 36121

Start Time: 07:00

Device: Miovision

### Full Study Heavy Vehicles

Time Period	FISHER AVE										BASELINE RD								Grand Total
	Northbound			Southbound				Eastbound			Westbound								
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	
07:00 07:15	3	7	0	10	1	1	0	2	12	0	4	0	4	0	6	0	6	10	22
07:15 07:30	1	1	0	2	0	5	0	5	7	0	7	1	8	0	8	1	9	17	24
07:30 07:45	0	6	0	6	0	2	0	2	8	0	5	0	5	0	5	0	5	10	18
07:45 08:00	1	4	0	5	0	3	1	4	9	1	10	1	12	0	4	2	6	18	27
08:00 08:15	0	2	0	2	0	4	0	4	6	0	8	0	8	0	8	2	10	18	24
08:15 08:30	2	6	0	8	1	4	0	5	13	1	6	4	11	0	7	1	8	19	32
08:30 08:45	0	3	0	3	0	2	0	2	5	0	11	1	12	1	9	2	12	24	29
08:45 09:00	1	4	0	5	0	5	1	6	11	0	10	0	10	0	10	1	11	21	32
09:00 09:15	3	2	0	5	0	4	0	4	9	0	6	2	8	0	13	0	13	21	30
09:15 09:30	1	3	1	5	0	6	0	6	11	1	6	2	9	1	6	0	7	16	27
09:30 09:45	0	3	0	3	3	2	1	6	9	1	5	1	7	0	9	0	9	16	25
09:45 10:00	1	2	0	3	1	3	0	4	7	0	3	2	5	2	6	0	8	13	20
11:30 11:45	1	3	2	6	2	2	1	5	11	0	8	2	10	0	5	1	6	16	27
11:45 12:00	2	3	1	6	0	2	0	2	8	0	3	2	5	1	6	1	8	13	21
12:00 12:15	3	2	0	5	0	4	1	5	10	1	7	1	9	0	8	0	8	17	27
12:15 12:30	0	3	1	4	0	7	1	8	12	1	6	1	8	2	8	1	11	19	31
12:30 12:45	0	3	0	3	0	8	0	8	11	1	4	0	5	0	7	2	9	14	25
12:45 13:00	2	4	0	6	1	5	0	6	12	0	5	1	6	2	4	1	7	13	25
13:00 13:15	1	3	0	4	0	4	0	4	8	0	9	0	9	0	6	0	6	15	23
13:15 13:30	0	3	0	3	1	3	1	5	8	1	7	2	10	1	8	1	10	20	28
15:00 15:15	1	3	0	4	1	6	0	7	11	0	5	0	5	1	6	0	7	12	23
15:15 15:30	0	2	0	2	1	4	1	6	8	0	5	2	7	0	4	0	4	11	19
15:30 15:45	0	6	0	6	1	4	0	5	11	1	6	1	8	1	6	0	7	15	26
15:45 16:00	2	2	0	4	0	3	0	3	7	0	5	1	6	1	3	1	5	11	18
16:00 16:15	0	1	1	2	1	4	0	5	7	1	8	0	9	1	6	1	8	17	24
16:15 16:30	0	2	1	3	0	4	0	4	7	0	6	0	6	1	4	0	5	11	18
16:30 16:45	0	2	0	2	0	4	0	4	6	1	11	1	13	1	5	0	6	19	25
16:45 17:00	1	3	1	5	1	5	0	6	11	0	2	0	2	2	4	1	7	9	20
17:00 17:15	0	1	0	1	2	5	0	7	8	0	4	0	4	1	4	0	5	9	17
17:15 17:30	0	3	0	3	1	7	0	8	11	0	3	0	3	2	2	0	4	7	18
17:30 17:45	0	3	1	4	0	5	1	6	10	0	6	0	6	0	3	0	3	9	19
17:45 18:00	0	1	1	2	1	7	0	8	10	0	4	2	6	0	1	0	1	7	17
Total: None	26	96	10	132	19	134	9	162	294	11	195	30	236	21	191	19	231	467	761



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BASELINE RD @ FISHER AVE

Survey Date: Wednesday, August 03, 2016

WO No: 36121

Start Time: 07:00

Device: Miovision

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

Time Period		FISHER AVE		BASELINE RD		Total
		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	1	1	0	2
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	1	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	1	1	2
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	1	0	1
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	1	0	0	1
Total		0	2	3	2	7



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BASELINE RD/HERON RD @ PRINCE OF WALES DR

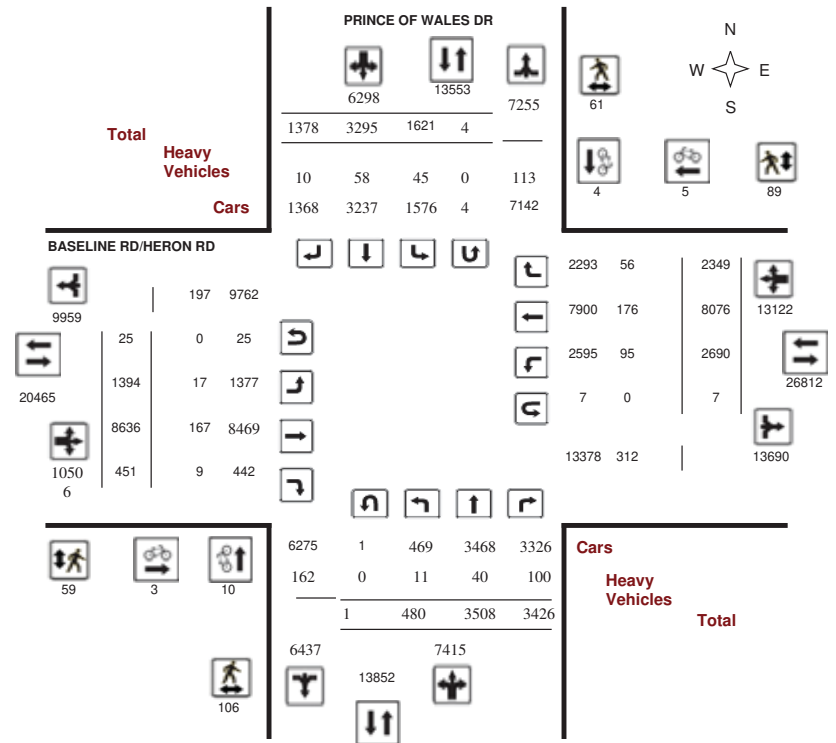
Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision

#### Full Study Diagram



5478543 - MAR 4, 2020 - 8HR REIMPORT



# Transportation Services - Traffic Services

## Turning Movement Count - Study Results

### BASELINE RD/HERON RD @ PRINCE OF WALES DR

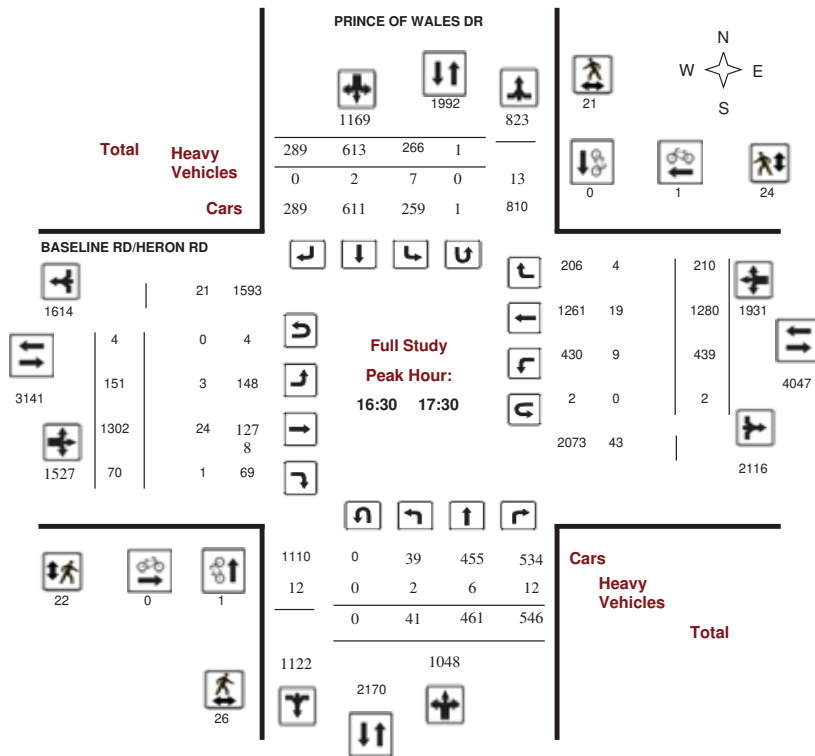
Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision

#### Full Study Peak Hour Diagram



5478543 - MAR 4, 2020 - 8HR REIMPORT



# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

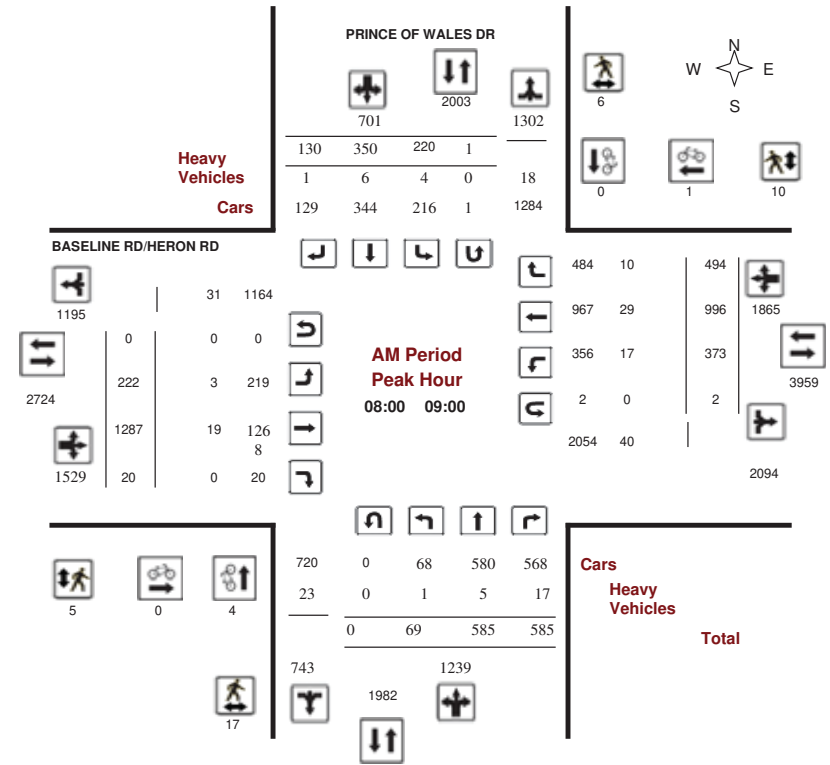
### BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision



Comments 5478543 - MAR 4, 2020 - 8HR REIMPORT



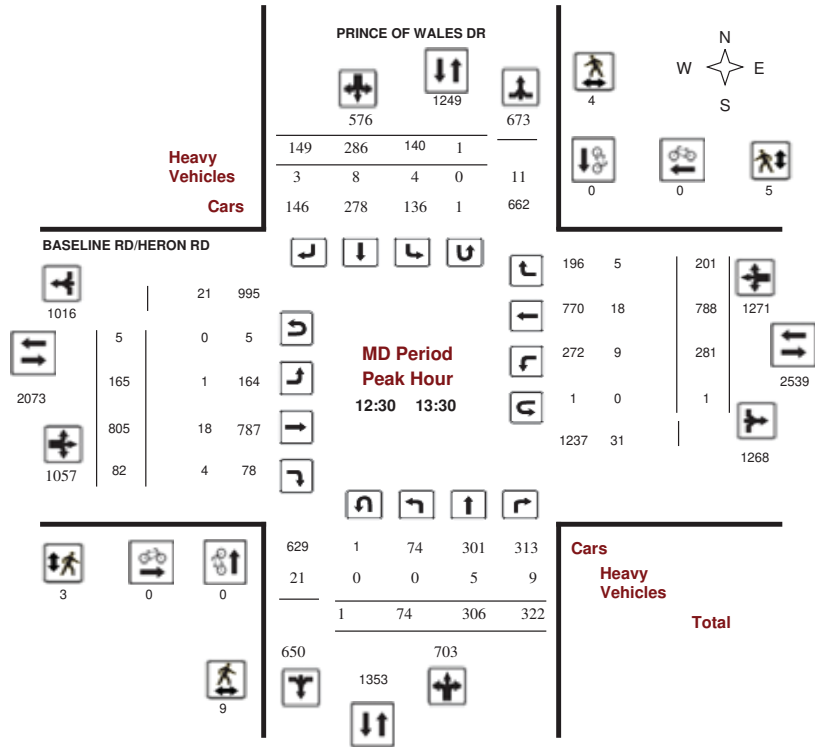
### Transportation Services - Traffic Services

#### Turning Movement Count - Peak Hour Diagram

#### BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020  
Start Time: 07:00

WO No: 39636  
Device: Miovision



Comments 5478543 - MAR 4, 2020 - 8HR REIMPORT



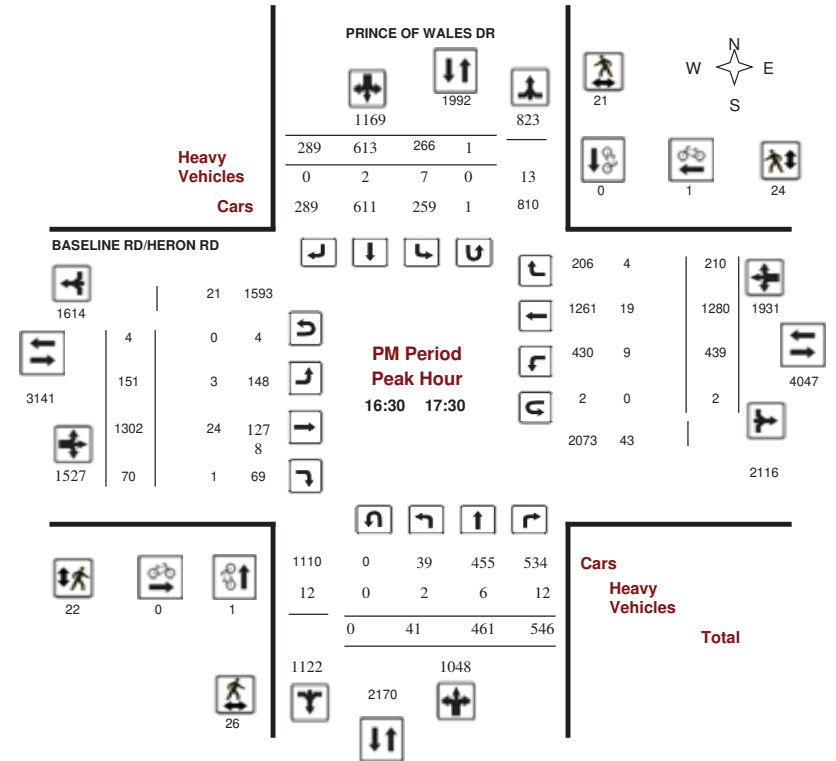
### Transportation Services - Traffic Services

#### Turning Movement Count - Peak Hour Diagram

#### BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020  
Start Time: 07:00

WO No: 39636  
Device: Miovision



Comments 5478543 - MAR 4, 2020 - 8HR REIMPORT



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, March 04, 2020

Total Observed U-Turns

AADT Factor

Northbound: 1 Southbound: 4
Eastbound: 25 Westbound: 7

Table with columns for PRINCE OF WALES DR (Northbound, Southbound) and BASELINE RD/HERON RD (Eastbound, Westbound). Rows include Period, LT, ST, RT, NB TOT, SB TOT, STR TOT, LT, ST, RT, EB TOT, WB TOT, STR TOT, Grand Total.

Summary row for U Turns: 1, 4, 5, 25, 7, 32, 37

Total row: 480, 3508, 3426, 7415, 1621, 3295, 1378, 6298, 13713, 1394, 8636, 451, 10506, 2690, 8076, 2349, 13122, 23628, 37341

EQ 12hr 667 4876 4762 10307 2253 4580 1915 8754 19061 1938 12004 627 14603 3739 11226 3265 18240 32843 51904

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

AVG 12hr 629 4595 4488 9714 2124 4316 1805 8250 19061 1826 11313 591 13763 3524 10580 3077 17190 32843 51904

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. 1

AVG 24hr 824 6020 5879 12725 2782 5655 2365 10808 23533 2392 14820 774 18029 4616 13859 4031 22519 40548 64081

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

BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

Table with columns for PRINCE OF WALES DR (Northbound, Southbound) and BASELINE RD/HERON RD (Eastbound, Westbound). Rows include Time Period, LT, ST, RT, N TOT, S TOT, STR TOT, LT, ST, RT, E TOT, W TOT, STR TOT, Grand Total.

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Table with columns: Time Period, Northbound, Southbound, Street Total, Eastbound, Westbound, Street Total, Grand Total. Rows show cyclist counts for various time intervals from 07:00 to 17:45.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Table with columns: Time Period, NB Approach, SB Approach, Total, EB Approach, WB Approach, Total, Grand Total. Rows show pedestrian counts for various time intervals from 07:00 to 17:45.

5478543 - MAR 4, 2020 - 8HR REIMPORT



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Wednesday, March 04, 2020

WO No: 39636

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

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



# Transportation Services - Traffic Services

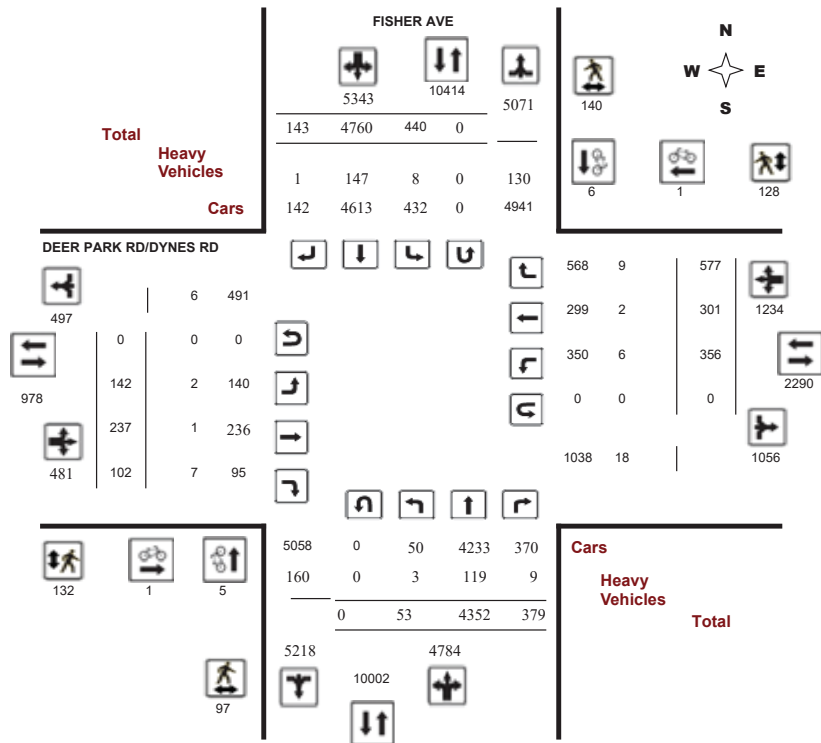
## Turning Movement Count - Study Results

### FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016  
Start Time: 07:00

WO No: 35788  
Device: Miovision

#### Full Study Diagram



# Transportation Services - Traffic Services

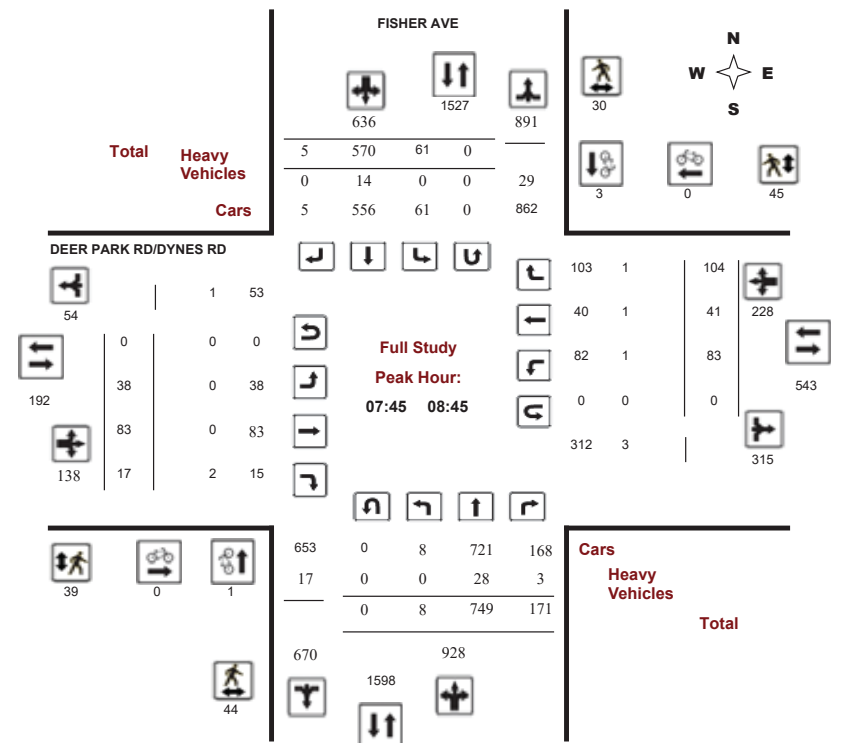
## Turning Movement Count - Study Results

### FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016  
Start Time: 07:00

WO No: 35788  
Device: Miovision

#### Full Study Peak Hour Diagram







### Transportation Services - Traffic Services

#### Turning Movement Count - Peak Hour Diagram

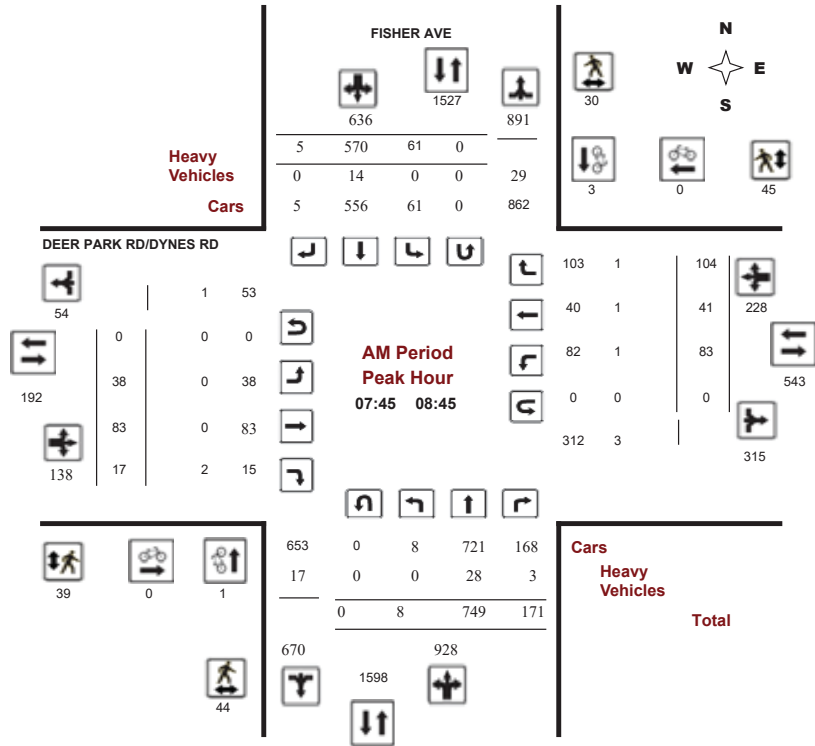
#### FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

Start Time: 07:00

WO No: 35788

Device: Miovision



### Transportation Services - Traffic Services

#### Turning Movement Count - Peak Hour Diagram

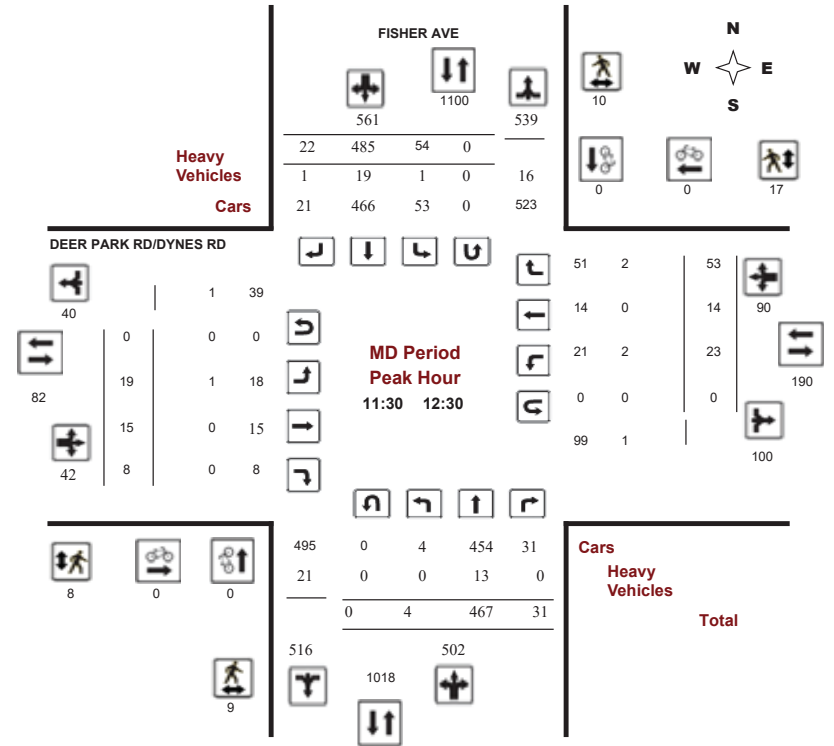
#### FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

Start Time: 07:00

WO No: 35788

Device: Miovision





### Transportation Services - Traffic Services

#### Turning Movement Count - Peak Hour Diagram

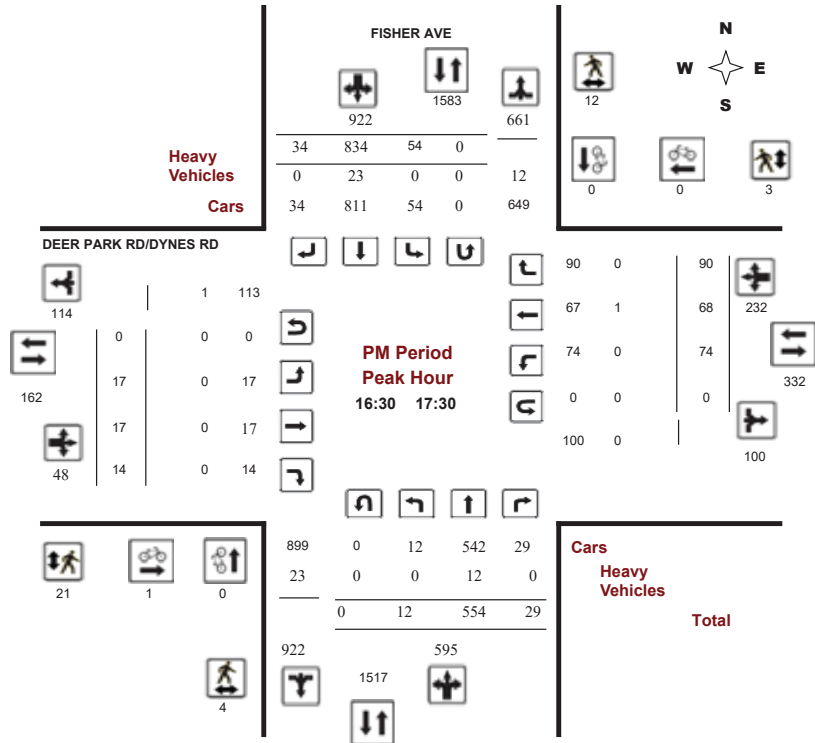
#### FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

Start Time: 07:00

WO No: 35788

Device: Miovision



### Transportation Services - Traffic Services

#### Turning Movement Count - Study Results

#### FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

Start Time: 07:00

WO No: 35788

Device: Miovision

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

Survey Date: Wednesday, March 09, 2016

**Total Observed U-Turns**

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

**AADT Factor** 1.00

Period	FISHER AVE								DEER PARK RD/DYNES RD								WB TOT	STR TOT	Grand Total
	Northbound				Southbound				Eastbound				Westbound						
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT			
07:00-08:00	6	632	69	707	51	512	7	570	1277	24	52	13	89	37	14	83	134	223	1500
08:00-09:00	6	746	140	892	49	584	10	643	1535	35	68	13	116	66	48	95	209	325	1860
09:00-10:00	6	468	30	504	45	448	13	506	1010	9	26	20	55	17	24	63	104	159	1169
11:30-12:30	4	467	31	502	54	485	22	561	1063	19	15	8	42	23	14	53	90	132	1195
12:30-13:30	5	410	23	438	45	445	15	505	943	11	10	10	31	18	11	44	73	104	1047
15:00-16:00	8	567	28	603	71	696	21	788	1391	9	31	13	53	59	57	75	191	244	1635
16:00-17:00	10	529	33	572	45	839	30	914	1486	14	22	10	46	84	77	78	239	285	1771
17:00-18:00	8	533	25	566	80	751	25	856	1422	21	13	15	49	52	56	86	194	243	1665
<b>Sub Total</b>	53	4352	379	4784	440	4760	143	5343	10127	142	237	102	481	356	301	577	1234	1715	11842
<b>U Turns</b>	0			0	0			0	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	53	4352	379	4784	440	4760	143	5343	10127	142	237	102	481	356	301	577	1234	1715	11842
<b>EQ 12Hr</b>	74	6049	527	6650	612	6616	199	7427	14077	197	329	142	668	495	418	802	1715	2383	16460
<b>AVG 12Hr</b>	74	6049	527	6650	612	6616	199	7427	14077	197	329	142	668	495	418	802	1715	2383	16460
<b>AVG 24Hr</b>	97	7924	690	8711	802	8667	261	9730	18441	258	431	186	875	648	548	1051	2247	3122	21563

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

1.39

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

1.00

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

1.31

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



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

WO No: 35788

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

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

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

WO No: 35788

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Table with columns for Time Period, FISHER AVE (Northbound, Southbound, Street Total), DEER PARK RD/DYNES RD (Eastbound, Westbound, Street Total), and Grand Total. Rows show 15-minute intervals from 07:00 to 18:00.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

WO No: 35788

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

FISHER AVE DEER PARK RD/DYNES RD

Table with columns: Time Period, NB Approach (E or W Crossing), SB Approach (E or W Crossing), Total, EB Approach (N or S Crossing), WB Approach (N or S Crossing), Total, Grand Total. Rows show pedestrian counts for various time intervals from 07:00 to 17:45.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

WO No: 35788

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

FISHER AVE DEER PARK RD/DYNES RD

Table with columns: Time Period, Northbound (LT, ST, RT, N TOT), Southbound (LT, ST, RT, S TOT), Eastbound (LT, ST, RT, E TOT), Westbound (LT, ST, RT, W TOT), STR TOT, Grand Total. Rows show heavy vehicle counts for various time intervals from 07:00 to 17:45.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

WO No: 35788

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

FISHER AVE DEER PARK RD/DYNES RD

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



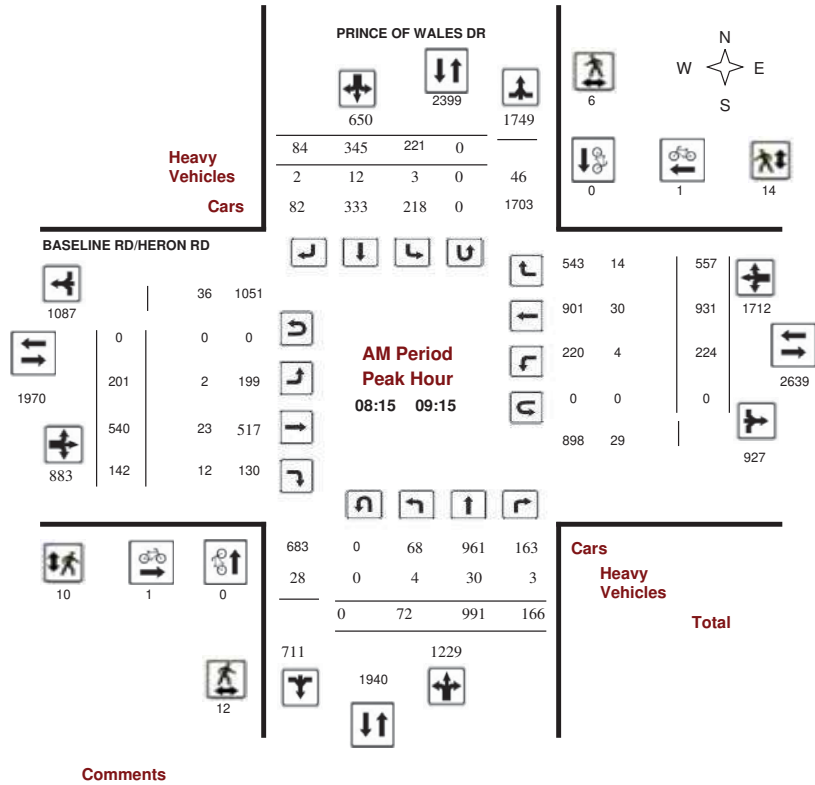
### Transportation Services - Traffic Services

#### Turning Movement Count - Peak Hour Diagram

#### BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Tuesday, January 19, 2016  
Start Time: 07:00

WO No: 35667  
Device: Miovision



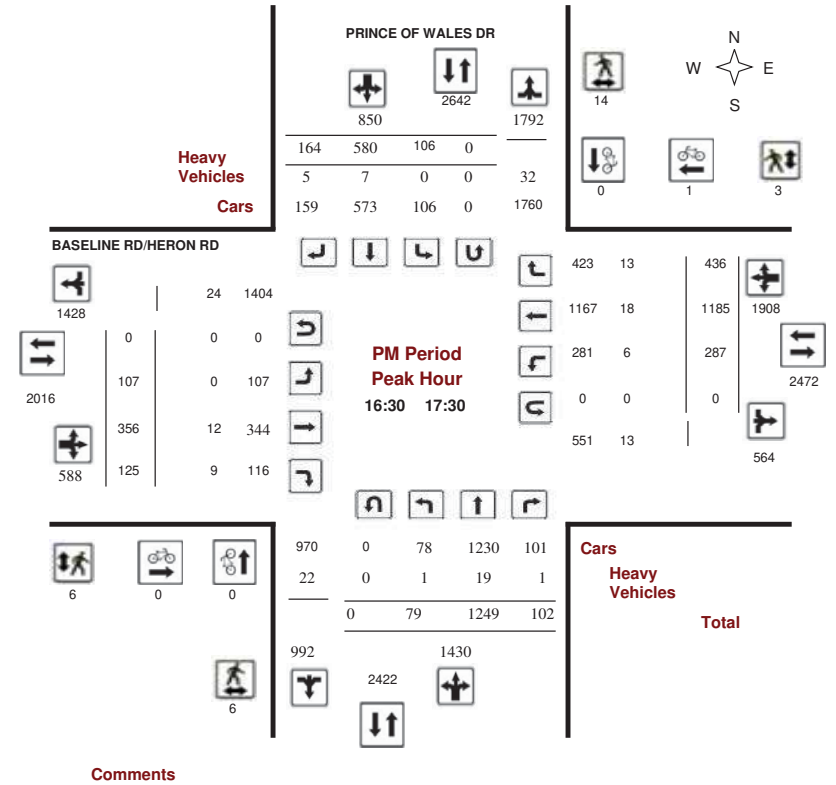
### Transportation Services - Traffic Services

#### Turning Movement Count - Peak Hour Diagram

#### BASELINE RD/HERON RD @ PRINCE OF WALES DR

Survey Date: Tuesday, January 19, 2016  
Start Time: 07:00

WO No: 35667  
Device: Miovision



# Appendix C

Synchro Intersection Worksheets – Existing Conditions

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

Existing  
AM Peak Hour

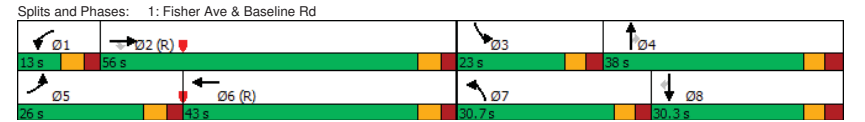
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	126	1300	152	32	1029	141	223	460	73	132	352	93
Future Volume (vph)	126	1300	152	32	1029	141	223	460	73	132	352	93
Satd. Flow (prot)	1658	3252	1469	3185	3183	0	1658	3252	1483	1658	3221	1483
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1655	3252	1401	3171	3183	0	1634	3252	1414	1650	3221	1418
Satd. Flow (RTOR)			180		12				181			231
Lane Group Flow (vph)	140	1444	169	36	1300	0	248	511	81	147	391	103
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3		8
Permitted Phases			2						4			8
Detector Phase	5	2	2	1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.3	29.1	29.1	11.3	29.1		10.9	30.3	30.3	10.9	30.3	30.3
Total Split (s)	26.0	56.0	56.0	13.0	43.0		30.7	38.0	38.0	23.0	30.3	30.3
Total Split (%)	20.0%	43.1%	43.1%	10.0%	33.1%		23.6%	29.2%	29.2%	17.7%	23.3%	23.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.4	2.4	2.6	2.4		2.6	3.0	3.0	2.6	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.1	6.1	6.3	6.1		5.9	6.3	6.3	5.9	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	15.7	60.5	60.5	6.4	46.4		22.7	28.1	28.1	15.2	20.7	20.7
Actuated g/C Ratio	0.12	0.47	0.47	0.05	0.36		0.17	0.22	0.22	0.12	0.16	0.16
v/c Ratio	0.70	0.95	0.23	0.23	1.14		0.86	0.73	0.18	0.76	0.76	0.25
Control Delay	73.0	49.6	3.8	82.3	91.0		78.6	53.6	0.9	79.3	62.4	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	49.6	3.8	82.3	91.0		78.6	53.6	0.9	79.3	62.4	1.4
LOS	E	D	A	F	F		E	D	A	E	E	A
Approach Delay		47.0			90.8			55.9			56.5	
Approach LOS		D			F			E			E	
Queue Length 50th (m)	34.8	~219.4	0.0	4.0	~216.0		61.1	64.1	0.0	36.5	51.0	0.0
Queue Length 95th (m)	55.3	#272.2	12.2	m2.7	m112.3		#100.0	81.1	0.0	#62.8	66.7	0.0
Internal Link Dist (m)		70.6			585.3			86.9			77.9	
Turn Bay Length (m)	124.5		58.5	134.0					85.0	65.0		60.0
Base Capacity (vph)	251	1513	748	165	1143		316	792	481	218	594	450
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.95	0.23	0.22	1.14		0.78	0.65	0.17	0.67	0.66	0.23

Intersection Summary	
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	119 (92%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	135
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

Existing  
AM Peak Hour

Maximum v/c Ratio:	1.14
Intersection Signal Delay:	62.8
Intersection Capacity Utilization:	89.9%
Analysis Period (min):	15
Intersection LOS:	E
ICU Level of Service:	E
~ 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.	
m Volume for 95th percentile queue is metered by upstream signal.	





Lanes, Volumes, Timings  
2: Prince of Wales Dr & Baseline Rd/Heron Rd

Existing  
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕↕	↔	↔	↕↕	↔	↔	↕↕	↔	↔	↕↕	↔
Traffic Volume (vph)	222	1287	20	373	996	494	69	585	585	220	350	130
Future Volume (vph)	222	1287	20	373	996	494	69	585	585	220	350	130
Satd. Flow (prot)	1658	4752	0	3124	3283	1483	1658	3316	1469	1658	3164	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1654	4752	0	3104	3283	1449	1653	3316	1428	1649	3164	0
Satd. Flow (RTOR)		2				452			364			38
Lane Group Flow (vph)	247	1452	0	414	1107	549	77	650	650	244	533	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6	6	7	4	4	3	8	
Permitted Phases						6			4			
Detector Phase	5	2		1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	12.0	12.0	5.0	12.0	
Minimum Split (s)	11.8	29.5		11.8	29.8	29.8	10.9	37.8	37.8	10.9	37.8	
Total Split (s)	22.0	38.0		30.0	30.0	30.0	24.0	38.0	38.0	24.0	38.0	
Total Split (%)	16.9%	29.2%		23.1%	23.1%	23.1%	18.5%	29.2%	29.2%	18.5%	29.2%	
Yellow Time (s)	3.7	3.0		3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	3.1	2.8		3.1	2.8	2.8	2.2	3.1	3.1	2.2	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	5.8		6.8	6.5	6.5	5.9	6.8	6.8	5.9	6.8	
Lead/Lag	Lag			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Min	Min	None	Min	
Act Effct Green (s)	15.2	34.3		21.1	23.5	23.5	11.4	31.2	31.2	18.1	40.5	
Actuated g/C Ratio	0.12	0.26		0.16	0.18	0.18	0.09	0.24	0.24	0.14	0.31	
v/c Ratio	1.28	1.16		0.82	1.87	0.87	0.53	0.82	1.05	1.06	0.53	
Control Delay	198.6	106.8		66.1	426.7	25.5	69.3	56.2	71.4	129.1	37.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	198.6	106.8		66.1	426.7	25.5	69.3	56.2	71.4	129.1	37.8	
LOS	F	F		E	F	C	E	E	E	F	D	
Approach Delay	120.1			248.1			64.1				66.5	
Approach LOS	F			F			E				E	
Queue Length 50th (m)	~78.2	~160.6		52.8	~226.9	24.0	19.2	83.3	~105.5	~68.4	56.6	
Queue Length 95th (m)	m#93.0	m#179.4		70.2	#268.6	#90.8	34.4	105.8	#177.9	#120.1	78.7	
Internal Link Dist (m)		188.2			122.0			142.9			135.6	
Turn Bay Length (m)	125.0			115.0		184.0	117.0		40.0	66.0		
Base Capacity (vph)	193	1254		557	593	632	230	795	619	230	1011	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.28	1.16		0.74	1.87	0.87	0.33	0.82	1.05	1.06	0.53	

Intersection Summary	
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	42 (32%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
2: Prince of Wales Dr & Baseline Rd/Heron Rd

Existing  
AM Peak Hour

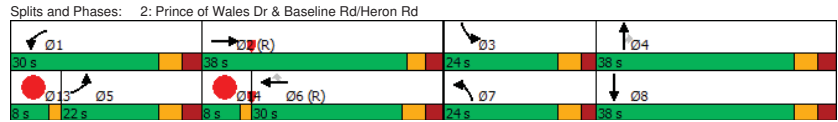
Lane Group	Ø13	Ø14
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	13	14
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum Split (s)	3.0	3.0
Total Split (s)	8.0	8.0
Total Split (%)	6%	6%
Yellow Time (s)	2.0	2.0
All-Red Time (s)	0.0	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Recall Mode	Max	Max
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary	
----------------------	--

Lanes, Volumes, Timings  
2: Prince of Wales Dr & Baseline Rd/Heron Rd

Existing  
AM Peak Hour

Maximum v/c Ratio: 1.87	
Intersection Signal Delay: 144.8	Intersection LOS: F
Intersection Capacity Utilization 96.1%	ICU Level of Service F
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.	
m Volume for 95th percentile queue is metered by upstream signal.	



Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

Existing  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	38	83	17	83	41	104	8	624	171	61	520	5
Future Volume (vph)	38	83	17	83	41	104	8	624	171	61	520	5
Satd. Flow (prot)	0	1660	0	0	1577	0	0	1710	1483	0	3292	0
Fit Permitted		0.830			0.834			0.991			0.762	
Satd. Flow (perm)	0	1390	0	0	1323	0	0	1696	1289	0	2521	0
Satd. Flow (RTOR)		9			56			190			2	
Lane Group Flow (vph)	0	153	0	0	254	0	0	702	190	0	652	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2		6		6
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.2	27.2	27.2	27.2	27.2	
Total Split (s)	33.0	33.0		33.0	33.0		47.0	47.0	47.0	47.0	47.0	
Total Split (%)	41.3%	41.3%		41.3%	41.3%		58.8%	58.8%	58.8%	58.8%	58.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	4.1	4.1		4.1	4.1		2.9	2.9	2.9	2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	
Total Lost Time (s)		7.1			7.1			6.2	6.2		6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)		19.6			19.6			47.1	47.1		47.1	
Actuated g/C Ratio		0.24			0.24			0.59	0.59		0.59	
v/c Ratio		0.44			0.69			0.70	0.23		0.44	
Control Delay		26.4			30.3			18.7	2.5		11.6	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		26.4			30.3			18.7	2.5		11.6	
LOS		C			C			B	A		B	
Approach Delay		26.4			30.3			15.2			11.6	
Approach LOS		C			C			B			B	
Queue Length 50th (m)		17.0			25.0			79.2	0.0		30.4	
Queue Length 95th (m)		31.2			46.5			#148.5	9.1		46.4	
Internal Link Dist (m)		152.1			156.9			172.3			30.0	
Turn Bay Length (m)												
Base Capacity (vph)		456			466			997	836		1483	
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		0.34			0.55			0.70	0.23		0.44	

Intersection Summary												
Cycle Length: 80												
Actuated Cycle Length: 80												
Offset: 78 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

Existing  
AM Peak Hour

Maximum v/c Ratio: 0.70	Intersection LOS: B
Intersection Signal Delay: 16.8	ICU Level of Service E
Intersection Capacity Utilization 90.4%	
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 6: Deer Park Rd/Dynes Rd & Fisher Ave



Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

Existing  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	90	1264	257	148	1274	179	174	375	71	154	597	148
Future Volume (vph)	90	1264	257	148	1274	179	174	375	71	154	597	148
Satd. Flow (prot)	1658	3283	1483	3185	3240	0	1658	3316	1455	1658	3283	1483
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1653	3283	1401	3153	3240	0	1641	3316	1396	1640	3283	1391
Satd. Flow (RTOR)			128		13				129			143
Lane Group Flow (vph)	100	1404	286	164	1615	0	193	417	79	171	663	164
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			8
Detector Phase	5	2	2	1	6		7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.3	29.2	29.2	11.3	29.2		10.9	30.3	30.3	10.9	30.3	30.3
Total Split (s)	21.0	54.0	54.0	21.0	54.0		24.7	30.3	30.3	24.7	30.3	30.3
Total Split (%)	16.2%	41.5%	41.5%	16.2%	41.5%		19.0%	23.3%	23.3%	19.0%	23.3%	23.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7		3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.5	2.5	2.6	2.5		2.6	2.5	2.5	2.6	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.2	6.2	6.3	6.2		5.9	5.8	5.8	5.9	5.8	5.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	12.3	51.7	51.7	11.9	51.2		17.8	25.3	25.3	17.0	24.5	24.5
Actuated g/C Ratio	0.09	0.40	0.40	0.09	0.39		0.14	0.19	0.19	0.13	0.19	0.19
v/c Ratio	0.64	1.08	0.45	0.57	1.26		0.85	0.65	0.21	0.79	1.07	0.43
Control Delay	74.7	86.2	18.6	64.0	156.8		86.3	53.7	2.4	79.9	106.8	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.7	86.2	18.6	64.0	156.8		86.3	53.7	2.4	79.9	106.8	13.9
LOS	E	F	B	E	F		F	D	A	E	F	B
Approach Delay		74.7			148.2			57.0				86.9
Approach LOS		E			F			E				F
Queue Length 50th (m)	24.9	~214.6	28.8	21.0	~279.3		48.5	52.6	0.0	42.3	~99.0	4.5
Queue Length 95th (m)	43.2	#266.5	55.9	32.0	#328.2		#86.3	70.5	2.3	#72.4	#136.5	24.6
Internal Link Dist (m)		45.3			582.5			85.7			67.0	
Turn Bay Length (m)	138.0		50.0	134.0			127.0		85.0	65.0		60.0
Base Capacity (vph)	187	1304	633	360	1284		239	645	375	239	618	378
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.53	1.08	0.45	0.46	1.26		0.81	0.65	0.21	0.72	1.07	0.43

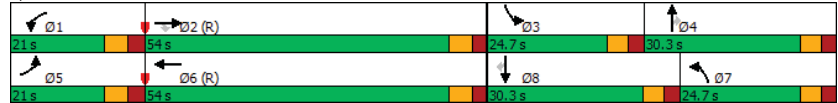
<b>Intersection Summary</b>												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 123 (95%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 145												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

Existing  
PM Peak Hour

Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 99.6	Intersection LOS: F
Intersection Capacity Utilization 97.5%	ICU Level of Service F
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: 1: Fisher Ave & Baseline Rd



Lanes, Volumes, Timings  
2: Prince of Wales Dr & Baseline Rd/Heron Rd

Existing  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕	↔	↔	↕↕	↔	↔	↕↕	↔	↕↕	↔	↕↕
Traffic Volume (vph)	151	1302	70	439	1280	210	41	461	546	266	613	289
Future Volume (vph)	151	1302	70	439	1280	210	41	461	546	266	613	289
Satd. Flow (prot)	1658	4713	0	3216	3316	1483	1610	3316	1483	1642	3117	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1650	4713	0	3187	3316	1412	1599	3316	1420	1617	3117	0
Satd. Flow (RTOR)		6				233			261			63
Lane Group Flow (vph)	168	1525	0	488	1422	233	46	512	607	296	1002	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6			4			
Detector Phase	5	2		1	6	6	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	12.0	12.0	12.0	5.0	10.0	
Minimum Split (s)	11.8	29.5		11.8	29.5	29.5	17.9	37.8	37.8	10.9	37.8	
Total Split (s)	15.0	42.0		23.0	42.0	42.0	17.9	38.0	38.0	27.0	49.0	
Total Split (%)	11.4%	31.8%		17.4%	31.8%	31.8%	13.6%	28.8%	28.8%	20.5%	37.1%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	3.1	2.8		3.1	2.8	2.8	2.2	3.1	3.1	2.2	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.8	6.5		6.8	6.5	6.5	5.9	6.8	6.8	5.9	6.8	
Lead/Lag	Lag						Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes						Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	Min	Min	Min	None	None	
Act Effct Green (s)	8.2	35.5		16.2	35.5	35.5	12.0	33.1	33.1	21.1	42.2	
Actuated g/C Ratio	0.06	0.27		0.12	0.27	0.27	0.09	0.25	0.25	0.16	0.32	
v/c Ratio	1.63	1.20		1.24	1.59	0.42	0.32	0.62	1.10	1.13	0.96	
Control Delay	361.0	139.0		174.3	305.7	7.1	62.4	47.5	95.6	144.4	61.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	361.0	139.0		174.3	305.7	7.1	62.4	47.5	95.6	144.4	61.8	
LOS	F	F		F	F	A	E	D	F	F	E	
Approach Delay		161.0			243.3			73.2			80.6	
Approach LOS		F			F			E			F	
Queue Length 50th (m)	-62.9	-176.1		-80.8	-277.4	0.0	11.4	62.4	-124.9	-89.0	128.1	
Queue Length 95th (m)	#107.8	#206.3		#114.8	#319.7	19.8	24.0	81.0	#196.2	#145.1	#172.4	
Internal Link Dist (m)		190.6			124.3			145.3			127.9	
Turn Bay Length (m)	125.0			115.0		243.0	117.0		40.0	66.0		
Base Capacity (vph)	103	1272		394	892	550	146	832	551	262	1040	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.63	1.20		1.24	1.59	0.42	0.32	0.62	1.10	1.13	0.96	

Intersection Summary

Cycle Length: 131.9
Actuated Cycle Length: 131.9
Offset: 84 (64%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
 2: Prince of Wales Dr & Baseline Rd/Heron Rd

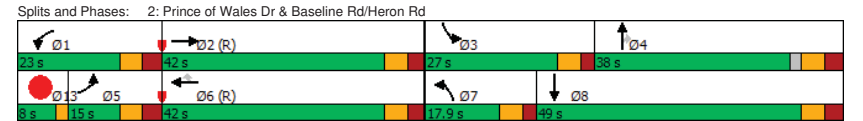
Existing  
 PM Peak Hour

Lane Group	Ø13
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Satd. Flow (prot)	
Fit Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	13
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	6.0
Total Split (s)	8.0
Total Split (%)	6%
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
 2: Prince of Wales Dr & Baseline Rd/Heron Rd

Existing  
 PM Peak Hour

Maximum v/c Ratio: 1.63	Intersection LOS: F
Intersection Signal Delay: 156.2	ICU Level of Service G
Intersection Capacity Utilization 106.2%	
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.	



Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

Existing  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔	↔		↔	
Traffic Volume (vph)	17	17	14	74	68	90	12	554	29	54	834	34
Future Volume (vph)	17	17	14	74	68	90	12	554	29	54	834	34
Satd. Flow (prot)	0	1638	0	0	1612	0	0	1743	1483	0	3247	0
Fit Permitted		0.818			0.873			0.973			0.872	
Satd. Flow (perm)	0	1359	0	0	1428	0	0	1698	1441	0	2840	0
Satd. Flow (RTOR)		16			33			47			7	
Lane Group Flow (vph)	0	54	0	0	258	0	0	629	32	0	1025	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2		2	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.2	27.2	27.2	27.2	27.2	
Total Split (s)	33.0	33.0		33.0	33.0		62.0	62.0	62.0	62.0	62.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		65.3%	65.3%	65.3%	65.3%	65.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	4.1	4.1		4.1	4.1		2.9	2.9	2.9	2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	
Total Lost Time (s)		7.1			7.1			6.2	6.2		6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)		19.9			19.9			61.8	61.8		61.8	
Actuated g/C Ratio		0.21			0.21			0.65	0.65		0.65	
v/c Ratio		0.18			0.80			0.57	0.03		0.55	
Control Delay		23.0			48.3			12.9	1.6		11.3	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		23.0			48.3			12.9	1.6		11.3	
LOS		C			D			B	A		B	
Approach Delay		23.0			48.3			12.3			11.3	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		5.7			39.2			58.6	0.0		49.2	
Queue Length 95th (m)		14.2			62.2			105.0	2.4		77.7	
Internal Link Dist (m)		145.0			146.3			187.2			22.4	
Turn Bay Length (m)												
Base Capacity (vph)		382			413			1105	954		1851	
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		0.14			0.62			0.57	0.03		0.55	

Intersection Summary												
Cycle Length: 95												
Actuated Cycle Length: 95												
Offset: 10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

Existing  
PM Peak Hour

Maximum v/c Ratio: 0.80	Intersection LOS: B
Intersection Signal Delay: 16.7	ICU Level of Service F
Intersection Capacity Utilization 93.6%	
Analysis Period (min) 15	



# Appendix D

Collision Data





# Appendix E

TRANS Model Plots

# TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

## AM Peak Hour Total Traffic Volume Network Mapping

2011 Model - Base case

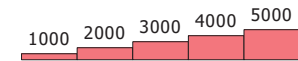
N/A

User Initials: TIMW  
Plot Prepared: May 31, 2021  
EMME Scenario: 21711



### Legend

AM Peak Hour Total Traffic Volume



Distance (m)



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

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

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

M4

# TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

## AM Peak Hour Total Traffic Volume Network Mapping

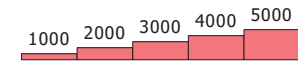
2011 Model - Base case  
N/A

User Initials: TIMW  
Plot Prepared: May 31, 2021  
EMME Scenario: 21711



### Legend

AM Peak Hour Total Traffic Volume



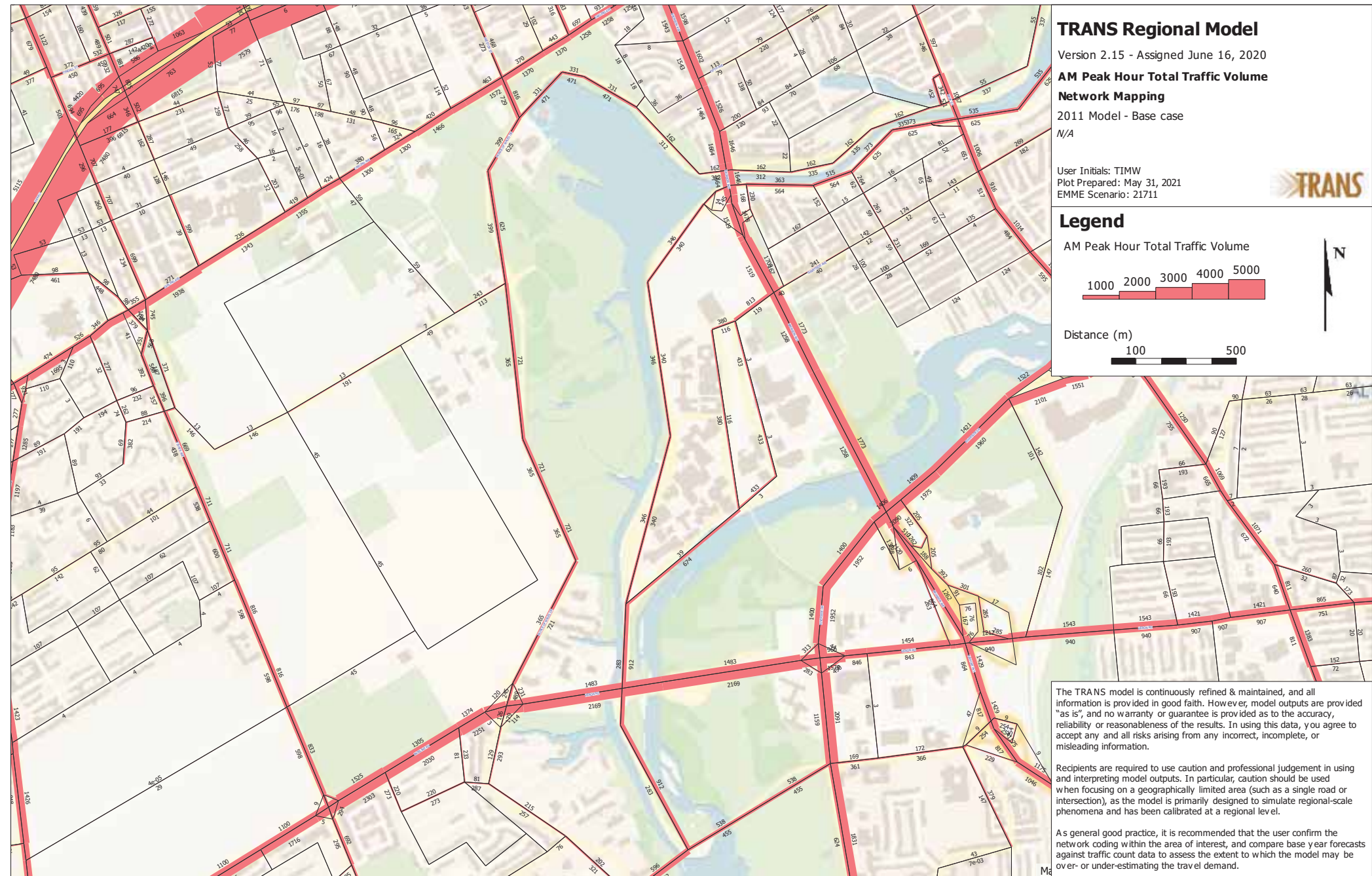
Distance (m)



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

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

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



# TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

## AM Peak Hour Total Traffic Volume Network Mapping

2031 Model - Base case

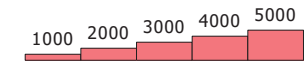
N/A

User Initials: TIMW  
Plot Prepared: May 31, 2021  
EMME Scenario: 21711



### Legend

AM Peak Hour Total Traffic Volume



Distance (m)



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

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

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

M4

# TRANS Regional Model

Version 2.40 - Assigned June 43, 2525

## AM Peak Hour Total Traffic Volume

### Network Mapping

2584 Model - Base case

N/A

User Initials: TIMW

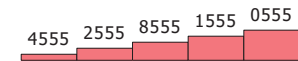
Plot Prepared: May 84, 2524

EMME Scenario: 24644



## Legend

AM Peak Hour Total Traffic Volume



Distance (m)



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

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

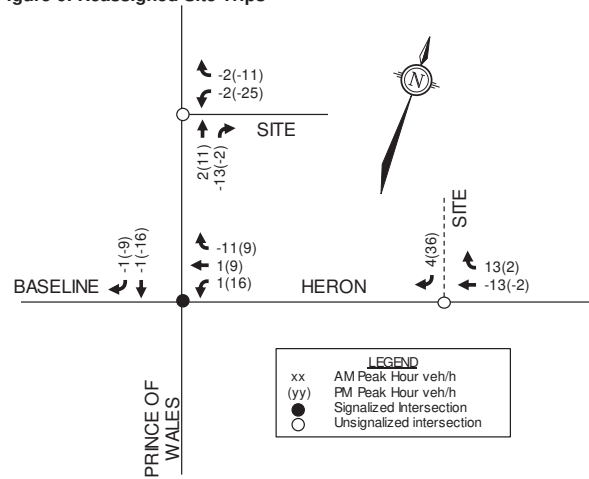
As a general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

M4

# Appendix F

Background development Volumes

Figure 6: Reassigned Site Trips



5.2 Background Traffic

5.2.1 Future Background Traffic

For the 'Inner Suburbs' area of Ottawa, Exhibit 2.10 of the 2013 TMP projects population and employment growth rates of approximately 0.3% and 1.2% per annum, respectively. To reflect the study area's development as an employment area, a 1% background growth rate has been applied to non-site traffic in this area.

This 1% background growth rate is in line with the annual historical (2000 to 2016) growth rate for this area (-2% to 2%) identified by the City of Ottawa (See **Figure 7**).

2020 and 2025 background traffic volumes for the study area are shown in **Figure 8** and **Figure 9**, respectively.

# Appendix G

Existing Site Generated Trip



Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Total	Auto Driver	71%	50	33	83	61%	42	50	92
	Auto Passenger	19%	32	26	58	16%	34	33	67
	Transit	1%	1	1	2	8%	17	16	33
	Cycling	0%	0	0	0	1%	1	1	2
	Walking	9%	14	12	26	14%	29	28	57
	Total	100%	97	72	169	100%	123	128	251

# Appendix H

Synchro Intersection Worksheets – 2034 Future Background Conditions

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Background  
AM Peak Hour

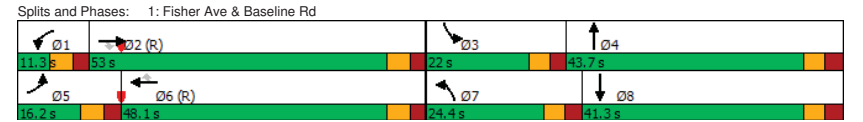
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↔	↕	↕	↔	↕	↕	↔	↕	↕
Traffic Volume (vph)	126	1300	152	32	1101	141	223	493	73	132	391	93
Future Volume (vph)	126	1300	152	32	1101	141	223	493	73	132	391	93
Satd. Flow (prot)	1658	3252	1469	1642	3252	1455	1658	3182	0	1658	3124	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1654	3252	1407	1634	3252	1419	1644	3182	0	1653	3124	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	126	1300	152	32	1101	141	223	566	0	132	484	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6				3	8	
Detector Phase	5	2	2	1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	11.3	41.2	41.2	11.3	41.2	41.2	10.9	41.3		10.9	41.3	
Total Split (s)	16.2	53.0	53.0	11.3	48.1	48.1	24.4	43.7		22.0	41.3	
Total Split (%)	12.5%	40.8%	40.8%	8.7%	37.0%	37.0%	18.8%	33.6%		16.9%	31.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.5	2.5	2.6	2.5	2.5	2.6	3.0		2.6	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.2	6.2	6.3	6.2	6.2	5.9	6.3		5.9	6.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	13.9	58.1	58.1	6.1	45.3	45.3	18.5	31.9		14.2	27.6	
Actuated g/C Ratio	0.11	0.45	0.45	0.05	0.35	0.35	0.14	0.25		0.11	0.21	
v/c Ratio	0.71	0.89	0.24	0.42	0.97	0.29	0.95	0.72		0.73	0.73	
Control Delay	78.0	43.9	26.9	59.0	88.0	65.4	102.1	50.5		78.9	53.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	78.0	43.9	26.9	59.0	88.0	65.4	102.1	50.5		78.9	53.9	
LOS	E	D	C	E	F	E	F	D		E	D	
Approach Delay		45.0			84.8		65.1			59.3		
Approach LOS		D			F		E			E		
Queue Length 50th (m)	30.6	170.6	25.5	8.6	~161.2	37.6	57.4	73.1		32.8	62.6	
Queue Length 95th (m)	#73.4	#242.4	45.5	m10.6m	#169.6	m40.9	#105.9	85.6		#55.0	74.5	
Internal Link Dist (m)		271.5			796.1			86.9			158.3	
Turn Bay Length (m)	124.5		100.0	134.0		91.5				65.0		
Base Capacity (vph)	177	1453	628	77	1132	494	235	915		205	841	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.71	0.89	0.24	0.42	0.97	0.29	0.95	0.62		0.64	0.58	

Intersection Summary	
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	135
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Background  
AM Peak Hour

Maximum v/c Ratio:	0.97
Intersection Signal Delay:	62.7
Intersection LOS:	E
Intersection Capacity Utilization:	96.2%
ICU Level of Service:	F
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.	
m Volume for 95th percentile queue is metered by upstream signal.	



Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

2034 Future Background  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	38	83	17	83	41	104	8	669	171	61	538	5
Future Volume (vph)	38	83	17	83	41	104	8	669	171	61	538	5
Satd. Flow (prot)	0	1660	0	0	1577	0	0	1710	1483	0	3293	0
Fit Permitted		0.849			0.843			0.993			0.799	
Satd. Flow (perm)	0	1421	0	0	1336	0	0	1699	1289	0	2644	0
Satd. Flow (RTOR)		9			56			171			1	
Lane Group Flow (vph)	0	138	0	0	228	0	0	677	171	0	604	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2		2	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.2	27.2	27.2	27.2	27.2	
Total Split (s)	33.0	33.0		33.0	33.0		47.0	47.0	47.0	47.0	47.0	
Total Split (%)	41.3%	41.3%		41.3%	41.3%		58.8%	58.8%	58.8%	58.8%	58.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	4.1	4.1		4.1	4.1		2.9	2.9	2.9	2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	
Total Lost Time (s)		7.1			7.1			6.2	6.2		6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)		19.0			19.0			47.7	47.7		47.7	
Actuated g/C Ratio		0.24			0.24			0.60	0.60		0.60	
v/c Ratio		0.40			0.63			0.67	0.20		0.38	
Control Delay		25.9			27.5			16.7	2.3		10.5	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		25.9			27.5			16.7	2.3		10.5	
LOS		C			C			B	A		B	
Approach Delay		25.9			27.5			13.8			10.5	
Approach LOS		C			C			B			B	
Queue Length 50th (m)		15.0			21.1			74.5	0.0		27.1	
Queue Length 95th (m)		29.4			42.2			117.4	8.2		39.0	
Internal Link Dist (m)		152.1			156.9			172.3			30.0	
Turn Bay Length (m)												
Base Capacity (vph)		466			470			1013	837		1577	
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		0.30			0.49			0.67	0.20		0.38	

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	78 (98%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

2034 Future Background  
AM Peak Hour

Maximum v/c Ratio: 0.67	Intersection LOS: B
Intersection Signal Delay: 15.3	ICU Level of Service F
Intersection Capacity Utilization 93.4%	
Analysis Period (min) 15	

Splits and Phases: 6: Deer Park Rd/Dynes Rd & Fisher Ave



Lanes, Volumes, Timings

2034 Future Background

8: Prince of Wales Dr & Baseline Rd/Heron Rd

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	201	540	142	225	1019	546	72	1134	166	221	394	83
Future Volume (vph)	201	540	142	225	1019	546	72	1134	166	221	394	83
Satd. Flow (prot)	1658	3186	0	1610	3283	1483	1658	3237	0	3216	3219	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1654	3186	0	1592	3283	1450	1652	3237	0	3205	3219	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	201	682	0	225	1019	546	72	1300	0	221	477	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	12.0		5.0	12.0	
Minimum Split (s)	11.8	29.5		11.8	29.8	29.8	10.9	37.8		10.9	37.8	
Total Split (s)	20.0	40.0		26.0	46.0	46.0	20.4	51.0		13.0	43.6	
Total Split (%)	15.4%	30.8%		20.0%	35.4%	35.4%	15.7%	39.2%		10.0%	33.5%	
Yellow Time (s)	3.7	3.0		3.7	3.7	3.7	3.7	3.7		3.7	3.7	
All-Red Time (s)	3.1	2.8		3.1	2.8	2.8	2.2	3.1		2.2	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.8	5.8		6.8	6.5	6.5	5.9	6.8		5.9	6.8	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Min		None	Min	
Act Effct Green (s)	13.2	34.2		19.2	39.5	39.5	10.8	44.2		7.1	43.0	
Actuated g/C Ratio	0.10	0.26		0.15	0.30	0.30	0.08	0.34		0.05	0.33	
v/c Ratio	1.20	0.81		0.95	1.02	1.24	0.53	1.18		1.26	0.45	
Control Delay	156.5	69.9		101.6	78.7	165.2	70.1	129.8		204.0	37.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	156.5	69.9		101.6	78.7	165.2	70.1	129.8		204.0	37.3	
LOS	F	E		F	E	F	E	F		F	D	
Approach Delay		89.7			108.0			126.7			90.1	
Approach LOS		F			F			F			F	
Queue Length 50th (m)	-64.3	98.6		57.9	-145.7	-173.4	18.0	-210.0		-36.5	52.1	
Queue Length 95th (m)	m#82.4	m111.3		#107.1	#186.8	#240.9	32.9	#252.3		#62.3	71.3	
Internal Link Dist (m)		796.1			320.4			142.9			135.6	
Turn Bay Length (m)	125.0			118.0		184.0	117.0			74.0		
Base Capacity (vph)	168	838		237	997	440	184	1100		175	1064	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	1.20	0.81		0.95	1.02	1.24	0.39	1.18		1.26	0.45	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings

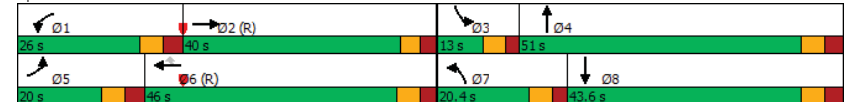
2034 Future Background

8: Prince of Wales Dr & Baseline Rd/Heron Rd

AM Peak Hour

Maximum v/c Ratio: 1.26	Intersection LOS: F
Intersection Signal Delay: 107.3	ICU Level of Service G
Intersection Capacity Utilization 108.6%	
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.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: Prince of Wales Dr & Baseline Rd/Heron Rd



Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Background  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	90	1358	257	148	1274	179	174	388	71	154	663	148
Future Volume (vph)	90	1358	257	148	1274	179	174	388	71	154	663	148
Satd. Flow (prot)	1658	3283	1483	1642	3316	1483	1658	3214	0	1658	3173	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1652	3283	1410	1633	3316	1431	1648	3214	0	1646	3173	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	90	1358	257	148	1274	179	174	459	0	154	811	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6						
Detector Phase	5	2	2	1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	11.3	33.2	33.2	11.3	33.2	33.2	10.9	41.5		10.9	41.5	
Total Split (s)	14.0	53.5	53.5	17.0	56.5	56.5	18.0	41.7		17.8	41.5	
Total Split (%)	10.8%	41.2%	41.2%	13.1%	43.5%	43.5%	13.8%	32.1%		13.7%	31.9%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.5	2.5	2.6	2.5	2.5	2.6	3.0		2.6	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.2	6.2	6.3	6.2	6.2	5.9	6.3		5.9	6.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	None	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	7.7	47.3	47.3	10.7	50.3	50.3	12.5	35.4		11.9	34.8	
Actuated g/C Ratio	0.06	0.36	0.36	0.08	0.39	0.39	0.10	0.27		0.09	0.27	
v/c Ratio	0.92	1.14	0.50	1.10	0.99	0.32	1.09	0.52		1.02	0.96	
Control Delay	131.2	110.7	36.3	128.7	62.6	42.2	151.1	42.7		136.1	68.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	131.2	110.7	36.3	128.7	62.6	42.2	151.1	42.7		136.1	68.8	
LOS	F	F	D	F	E	D	F	D		F	E	
Approach Delay		100.6			66.4			72.5			79.6	
Approach LOS		F			E			E			E	
Queue Length 50th (m)	23.4	~213.1	50.9	~43.6	130.7	33.5	~51.5	52.6		~40.8	107.5	
Queue Length 95th (m)	#56.4	#255.3	77.1	m#46.8	m123.1	m33.9	#96.8	69.6		#84.7	#146.3	
Internal Link Dist (m)		192.5			794.8			85.7			126.1	
Turn Bay Length (m)	124.5		100.0	134.0		91.5	127.0			65.0		
Base Capacity (vph)	98	1194	513	135	1283	553	160	875		151	859	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.92	1.14	0.50	1.10	0.99	0.32	1.09	0.52		1.02	0.94	

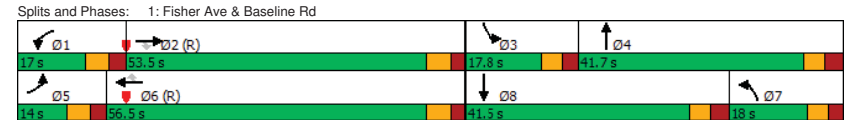
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Background  
PM Peak Hour

Maximum v/c Ratio: 1.14	Intersection LOS: F
Intersection Signal Delay: 81.7	ICU Level of Service G
Intersection Capacity Utilization 105.5%	
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.	
m Volume for 95th percentile queue is metered by upstream signal.	



Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

2034 Future Background  
PM Peak Hour

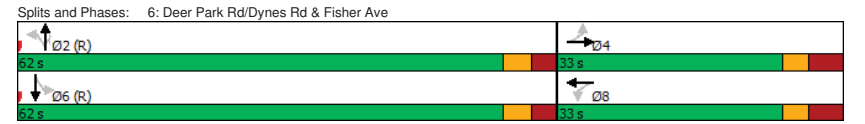
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	17	17	14	74	68	90	12	574	29	54	894	34
Future Volume (vph)	17	17	14	74	68	90	12	574	29	54	894	34
Satd. Flow (prot)	0	1640	0	0	1611	0	0	1743	1483	0	3251	0
Fit Permitted		0.830			0.875			0.976			0.885	
Satd. Flow (perm)	0	1381	0	0	1431	0	0	1703	1441	0	2885	0
Satd. Flow (RTOR)		14			33			47			6	
Lane Group Flow (vph)	0	48	0	0	232	0	0	586	29	0	982	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2		2	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.2	27.2	27.2	27.2	27.2	
Total Split (s)	33.0	33.0		33.0	33.0		62.0	62.0	62.0	62.0	62.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		65.3%	65.3%	65.3%	65.3%	65.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	4.1	4.1		4.1	4.1		2.9	2.9	2.9	2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	
Total Lost Time (s)		7.1			7.1			6.2	6.2		6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)		18.6			18.6			63.1	63.1		63.1	
Actuated g/C Ratio		0.20			0.20			0.66	0.66		0.66	
v/c Ratio		0.17			0.76			0.52	0.03		0.51	
Control Delay		23.6			45.9			11.3	1.3		10.1	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		23.6			45.9			11.3	1.3		10.1	
LOS		C			D			B	A		B	
Approach Delay		23.6			45.9			10.9			10.1	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		5.2			34.7			49.3	0.0		42.9	
Queue Length 95th (m)		13.1			54.7			93.7	2.1		72.1	
Internal Link Dist (m)		145.0			146.3			187.2			22.4	
Turn Bay Length (m)												
Base Capacity (vph)		386			414			1131	973		1919	
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		0.12			0.56			0.52	0.03		0.51	

Intersection Summary	
Cycle Length:	95
Actuated Cycle Length:	95
Offset:	10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

2034 Future Background  
PM Peak Hour

Maximum v/c Ratio: 0.76	Intersection LOS: B
Intersection Signal Delay: 15.1	ICU Level of Service F
Intersection Capacity Utilization 96.5%	
Analysis Period (min) 15	



Lanes, Volumes, Timings

2034 Future Background

8: Prince of Wales Dr & Baseline Rd/Heron Rd

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	107	389	125	303	1194	445	79	1429	102	106	647	155
Future Volume (vph)	107	389	125	303	1194	445	79	1429	102	106	647	155
Satd. Flow (prot)	1658	3153	0	1658	3316	1483	1610	3273	0	3185	3195	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1647	3153	0	1622	3316	1413	1596	3273	0	3166	3195	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	107	514	0	303	1194	445	79	1531	0	106	802	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	12.0	12.0		5.0	10.0	
Minimum Split (s)	11.8	29.5		11.8	29.5	29.5	17.9	37.8		10.9	37.8	
Total Split (s)	14.0	31.0		31.0	48.0	48.0	18.0	57.0		11.0	50.0	
Total Split (%)	10.8%	23.8%		23.8%	36.9%	36.9%	13.8%	43.8%		8.5%	38.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	
All-Red Time (s)	3.1	2.8		3.1	2.8	2.8	2.2	3.1		2.2	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.8	6.5		6.8	6.5	6.5	5.9	6.8		5.9	6.8	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	Min	Min		None	None	
Act Effct Green (s)	7.2	24.5		24.2	41.5	41.5	12.0	50.2		5.1	43.3	
Actuated g/C Ratio	0.06	0.19		0.19	0.32	0.32	0.09	0.39		0.04	0.33	
v/c Ratio	1.18	0.87		0.98	1.13	0.99	0.53	1.21		0.85	0.75	
Control Delay	126.9	63.8		100.0	110.9	83.4	70.1	138.8		110.7	44.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	126.9	63.8		100.0	110.9	83.4	70.1	138.8		110.7	44.1	
LOS	F	E		F	F	F	E	F		F	D	
Approach Delay		74.6			102.9			135.5			51.9	
Approach LOS		E			F			F			D	
Queue Length 50th (m)	-32.7	74.0		78.1	~186.2	113.2	19.6	~251.8		14.1	96.0	
Queue Length 95th (m)	m#28.5	m#7.1		#135.5	#228.2	#180.7	36.2	#294.4		#31.1	119.8	
Internal Link Dist (m)		794.8			323.7			145.3			127.9	
Turn Bay Length (m)	125.0			118.0		184.0	117.0			74.0		
Base Capacity (vph)	91	594		308	1058	451	149	1263		124	1063	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	1.18	0.87		0.98	1.13	0.99	0.53	1.21		0.85	0.75	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

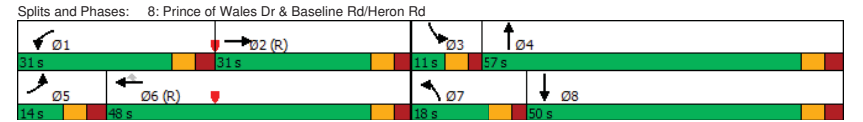
Lanes, Volumes, Timings

2034 Future Background

8: Prince of Wales Dr & Baseline Rd/Heron Rd

PM Peak Hour

Maximum v/c Ratio: 1.21	Intersection LOS: F
Intersection Signal Delay: 100.6	ICU Level of Service H
Intersection Capacity Utilization 112.2%	
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.	
m Volume for 95th percentile queue is metered by upstream signal.	





# Appendix I

TDM Checklist

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

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

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

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

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

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

**TDM Measures Checklist:**

*Residential Developments (multi-family, condominium or subdivision)*

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

TDM measures: Residential developments		Check if proposed & add descriptions
<b>1. TDM PROGRAM MANAGEMENT</b>		
<b>1.1 Program coordinator</b>		
<b>BASIC</b> ★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	<input type="checkbox"/>
<b>1.2 Travel surveys</b>		
<b>BETTER</b>	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input type="checkbox"/>
<b>2. WALKING AND CYCLING</b>		
<b>2.1 Information on walking/cycling routes &amp; destinations</b>		
<b>BASIC</b>	2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances ( <i>multi-family, condominium</i> )	<input checked="" type="checkbox"/>
<b>2.2 Bicycle skills training</b>		
<b>BETTER</b>	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	<input type="checkbox"/>

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

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

# Appendix J

Synchro Intersection Worksheets – 2034 Future Total Conditions

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Total  
AM Peak Hour

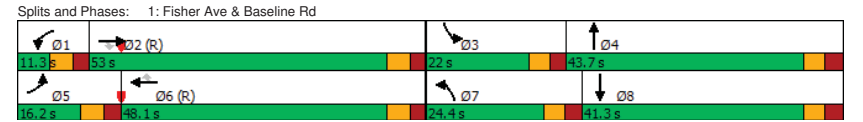
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	126	1294	152	35	1096	141	238	506	94	132	389	93
Future Volume (vph)	126	1294	152	35	1096	141	238	506	94	132	389	93
Satd. Flow (prot)	1658	3252	1469	1642	3252	1455	1658	3162	0	1658	3087	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1653	3252	1132	1583	3252	1409	1593	3162	0	1651	3087	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	126	1294	152	35	1096	141	238	600	0	132	482	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6				3	8	
Detector Phase	5	2	2	1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	11.3	41.2	41.2	11.3	41.2	41.2	10.9	41.3		10.9	41.3	
Total Split (s)	16.2	53.0	53.0	11.3	48.1	48.1	24.4	43.7		22.0	41.3	
Total Split (%)	12.5%	40.8%	40.8%	8.7%	37.0%	37.0%	18.8%	33.6%		16.9%	31.8%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.5	2.5	2.6	2.5	2.5	2.6	3.0		2.6	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.2	6.2	6.3	6.2	6.2	5.9	6.3		5.9	6.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	None	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	13.9	55.0	55.0	6.3	44.9	44.9	18.5	32.3		14.2	27.9	
Actuated g/C Ratio	0.11	0.42	0.42	0.05	0.35	0.35	0.14	0.25		0.11	0.21	
v/c Ratio	0.71	0.94	0.32	0.44	0.98	0.29	1.01	0.77		0.73	0.73	
Control Delay	78.2	51.2	30.2	59.7	88.7	65.8	116.9	52.1		78.9	53.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	78.2	51.2	30.2	59.7	88.7	65.8	116.9	52.1		78.9	53.6	
LOS	E	D	C	E	F	E	F	D		E	D	
Approach Delay		51.3			85.3			70.5			59.0	
Approach LOS		D			F			E			E	
Queue Length 50th (m)	30.6	~177.0	27.0	9.3	~165.2	37.7	~62.6	77.3		32.8	61.4	
Queue Length 95th (m)	#73.4	#240.7	47.8	m11.2m#168.4	m41.2	#115.5	91.5	#55.0		74.4		
Internal Link Dist (m)		271.5			796.1			86.9			158.3	
Turn Bay Length (m)	124.5		100.0	134.0		91.5				65.0		
Base Capacity (vph)	177	1375	478	79	1124	487	235	909		205	831	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.71	0.94	0.32	0.44	0.98	0.29	1.01	0.66		0.64	0.58	

Intersection Summary	
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	145
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Total  
AM Peak Hour

Maximum v/c Ratio:	1.01	Intersection LOS:	E
Intersection Signal Delay:	66.2	ICU Level of Service:	G
Intersection Capacity Utilization:	104.2%		
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.			
m Volume for 95th percentile queue is metered by upstream signal.			



Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

2034 Future Total  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	38	83	17	83	41	104	8	668	171	61	551	5
Future Volume (vph)	38	83	17	83	41	104	8	668	171	61	551	5
Satd. Flow (prot)	0	1634	0	0	1576	0	0	1710	1483	0	3292	0
Fit Permitted		0.851			0.843			0.993			0.800	
Satd. Flow (perm)	0	1402	0	0	1284	0	0	1699	1281	0	2647	0
Satd. Flow (RTOR)		9			56			171			1	
Lane Group Flow (vph)	0	138	0	0	228	0	0	676	171	0	617	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2		2	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.2	27.2	27.2	27.2	27.2	
Total Split (s)	33.0	33.0		33.0	33.0		47.0	47.0	47.0	47.0	47.0	
Total Split (%)	41.3%	41.3%		41.3%	41.3%		58.8%	58.8%	58.8%	58.8%	58.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	4.1	4.1		4.1	4.1		2.9	2.9	2.9	2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	
Total Lost Time (s)		7.1			7.1			6.2	6.2		6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)		19.2			19.2			47.5	47.5		47.5	
Actuated g/C Ratio		0.24			0.24			0.59	0.59		0.59	
v/c Ratio		0.40			0.65			0.67	0.21		0.39	
Control Delay		25.7			28.3			17.0	2.4		10.7	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		25.7			28.3			17.0	2.4		10.7	
LOS		C			C			B	A		B	
Approach Delay		25.7			28.3			14.1			10.7	
Approach LOS		C			C			B			B	
Queue Length 50th (m)		15.0			21.2			74.3	0.0		27.9	
Queue Length 95th (m)		29.0			42.2			120.2	8.4		41.0	
Internal Link Dist (m)		152.1			156.9			172.3			30.0	
Turn Bay Length (m)												
Base Capacity (vph)		459			453			1008	830		1572	
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		0.30			0.50			0.67	0.21		0.39	

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	78 (98%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

2034 Future Total  
AM Peak Hour

Maximum v/c Ratio:	0.67
Intersection Signal Delay:	15.6
Intersection LOS:	B
Intersection Capacity Utilization:	93.8%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 6: Deer Park Rd/Dynes Rd & Fisher Ave





Lanes, Volumes, Timings

8: Prince of Wales Dr & Baseline Rd/Heron Rd

2034 Future Total

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	206	550	142	225	1018	546	72	1134	166	221	394	82
Future Volume (vph)	206	550	142	225	1018	546	72	1134	166	221	394	82
Satd. Flow (prot)	1658	3156	0	1610	3283	1483	1658	3237	0	3216	3219	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1654	3156	0	1567	3283	1445	1652	3237	0	3205	3219	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	206	692	0	225	1018	546	72	1300	0	221	476	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	5.0	12.0		5.0	12.0	
Minimum Split (s)	11.8	29.5		11.8	29.8	29.8	10.9	37.8		10.9	37.8	
Total Split (s)	20.0	40.0		26.0	46.0	46.0	20.4	51.0		13.0	43.6	
Total Split (%)	15.4%	30.8%		20.0%	35.4%	35.4%	15.7%	39.2%		10.0%	33.5%	
Yellow Time (s)	3.7	3.0		3.7	3.7	3.7	3.7	3.7		3.7	3.7	
All-Red Time (s)	3.1	2.8		3.1	2.8	2.8	2.2	3.1		2.2	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.8	5.8		6.8	6.5	6.5	5.9	6.8		5.9	6.8	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Min		None	Min	
Act Effct Green (s)	13.2	34.2		19.2	39.5	39.5	10.8	44.2		7.1	43.0	
Actuated g/C Ratio	0.10	0.26		0.15	0.30	0.30	0.08	0.34		0.05	0.33	
v/c Ratio	1.23	0.83		0.95	1.02	1.24	0.53	1.18		1.26	0.45	
Control Delay	163.7	72.6		101.6	78.5	166.3	70.1	129.8		204.0	37.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	163.7	72.6		101.6	78.5	166.3	70.1	129.8		204.0	37.2	
LOS	F	E		F	E	F	E	F		F	D	
Approach Delay		93.5			108.2			126.7			90.1	
Approach LOS		F			F			F			F	
Queue Length 50th (m)	-67.1	100.1		57.9	-145.4	-173.8	18.0	-210.0		-36.5	51.9	
Queue Length 95th (m)	m#80.0	m108.3		#107.1	#186.6	#241.3	32.9	#252.3		#62.3	71.3	
Internal Link Dist (m)		796.1			320.4			142.9			135.6	
Turn Bay Length (m)	125.0			118.0		184.0	117.0			74.0		
Base Capacity (vph)	168	830		237	997	439	184	1100		175	1064	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	1.23	0.83		0.95	1.02	1.24	0.39	1.18		1.26	0.45	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings

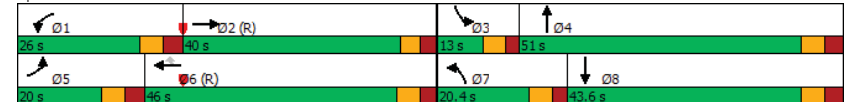
8: Prince of Wales Dr & Baseline Rd/Heron Rd

2034 Future Total

AM Peak Hour

Maximum v/c Ratio: 1.26	Intersection LOS: F
Intersection Signal Delay: 108.1	ICU Level of Service G
Intersection Capacity Utilization 108.9%	
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.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: Prince of Wales Dr & Baseline Rd/Heron Rd



Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Total  
PM Peak Hour

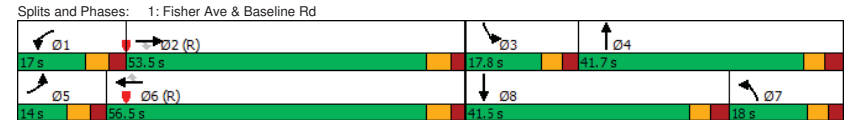
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	90	1342	257	173	1259	179	189	388	88	154	671	148
Future Volume (vph)	90	1342	257	173	1259	179	189	388	88	154	671	148
Satd. Flow (prot)	1658	3283	1483	1642	3316	1483	1658	3189	0	1658	3138	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1650	3283	1136	1585	3316	1416	1617	3189	0	1643	3138	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	90	1342	257	173	1259	179	189	476	0	154	819	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6				3	8	
Detector Phase	5	2	2	1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0		5.0	10.0	
Minimum Split (s)	11.3	33.2	33.2	11.3	33.2	33.2	10.9	41.5		10.9	41.5	
Total Split (s)	14.0	53.5	53.5	17.0	56.5	56.5	18.0	41.7		17.8	41.5	
Total Split (%)	10.8%	41.2%	41.2%	13.1%	43.5%	43.5%	13.8%	32.1%		13.7%	31.9%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.6	2.5	2.5	2.6	2.5	2.5	2.6	3.0		2.6	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.2	6.2	6.3	6.2	6.2	5.9	6.3		5.9	6.3	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	7.7	47.3	47.3	10.7	50.3	50.3	12.2	35.4		11.9	35.1	
Actuated g/C Ratio	0.06	0.36	0.36	0.08	0.39	0.39	0.09	0.27		0.09	0.27	
v/c Ratio	0.92	1.12	0.62	1.28	0.98	0.33	1.22	0.55		1.02	0.97	
Control Delay	131.2	105.7	41.9	191.3	60.0	42.2	190.4	43.3		136.1	71.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	131.2	105.7	41.9	191.3	60.0	42.2	190.4	43.3		136.1	71.0	
LOS	F	F	D	F	E	D	F	D		F	E	
Approach Delay		97.4			72.1			85.1			81.3	
Approach LOS		F			E			F			F	
Queue Length 50th (m)	23.4	~208.6	53.8	~57.0	129.1	33.6	~59.5	55.1		~40.8	109.3	
Queue Length 95th (m)	#56.4	#250.8	84.0	m#59.6	m121.3	m33.6	#106.4	72.5		#84.7	#149.8	
Internal Link Dist (m)		192.5			794.8			85.7			126.1	
Turn Bay Length (m)	124.5		100.0	134.0		91.5	127.0			65.0		
Base Capacity (vph)	98	1194	413	135	1283	547	155	868		151	849	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.92	1.12	0.62	1.28	0.98	0.33	1.22	0.55		1.02	0.96	

Intersection Summary	
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Total  
PM Peak Hour

Maximum v/c Ratio:	1.28
Intersection Signal Delay:	84.3
Intersection LOS:	F
Intersection Capacity Utilization:	109.7%
ICU Level of Service:	H
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.
m	Volume for 95th percentile queue is metered by upstream signal.



Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

2034 Future Total  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	17	17	14	74	68	90	12	578	29	54	894	34
Future Volume (vph)	17	17	14	74	68	90	12	578	29	54	894	34
Satd. Flow (prot)	0	1572	0	0	1609	0	0	1743	1483	0	3248	0
Fit Permitted		0.836			0.875			0.976			0.884	
Satd. Flow (perm)	0	1331	0	0	1367	0	0	1703	1423	0	2879	0
Satd. Flow (RTOR)		14			33			47			6	
Lane Group Flow (vph)	0	48	0	0	232	0	0	590	29	0	982	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2		2	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.2	27.2	27.2	27.2	27.2	
Total Split (s)	33.0	33.0		33.0	33.0		62.0	62.0	62.0	62.0	62.0	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		65.3%	65.3%	65.3%	65.3%	65.3%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	4.1	4.1		4.1	4.1		2.9	2.9	2.9	2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	
Total Lost Time (s)		7.1			7.1			6.2	6.2		6.2	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)		19.0			19.0			62.7	62.7		62.7	
Actuated g/C Ratio		0.20			0.20			0.66	0.66		0.66	
v/c Ratio		0.17			0.78			0.53	0.03		0.52	
Control Delay		23.4			47.5			11.6	1.3		10.4	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		23.4			47.5			11.6	1.3		10.4	
LOS		C			D			B	A		B	
Approach Delay		23.4			47.5			11.2			10.4	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		5.1			34.7			51.0	0.0		43.9	
Queue Length 95th (m)		13.2			55.5			94.4	2.1		72.2	
Internal Link Dist (m)		145.0			146.3			187.2			22.4	
Turn Bay Length (m)												
Base Capacity (vph)		373			396			1123	955		1902	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.13			0.59			0.53	0.03		0.52	

Intersection Summary												
Cycle Length: 95												
Actuated Cycle Length: 95												
Offset: 10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 65												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings  
6: Deer Park Rd/Dynes Rd & Fisher Ave

2034 Future Total  
PM Peak Hour

Maximum v/c Ratio: 0.78	Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 97.9%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 6: Deer Park Rd/Dynes Rd & Fisher Ave



Lanes, Volumes, Timings

8: Prince of Wales Dr & Baseline Rd/Heron Rd

2034 Future Total

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	107	389	125	303	1201	445	79	1429	102	106	647	159
Future Volume (vph)	107	389	125	303	1201	445	79	1429	102	106	647	159
Satd. Flow (prot)	1658	3113	0	1658	3316	1483	1610	3273	0	3185	3191	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1647	3113	0	1584	3316	1406	1596	3273	0	3166	3191	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	107	514	0	303	1201	445	79	1531	0	106	806	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	12.0	12.0		5.0	10.0	
Minimum Split (s)	11.8	29.5		11.8	29.5	29.5	17.9	37.8		10.9	37.8	
Total Split (s)	14.0	31.0		31.0	48.0	48.0	18.0	57.0		11.0	50.0	
Total Split (%)	10.8%	23.8%		23.8%	36.9%	36.9%	13.8%	43.8%		8.5%	38.5%	
Yellow Time (s)	3.7	3.7		3.7	3.7	3.7	3.7	3.7		3.7	3.7	
All-Red Time (s)	3.1	2.8		3.1	2.8	2.8	2.2	3.1		2.2	3.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.8	6.5		6.8	6.5	6.5	5.9	6.8		5.9	6.8	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max	C-Max	Min	Min		None	None	
Act Effct Green (s)	7.2	24.5		24.2	41.5	41.5	12.0	50.2		5.1	43.3	
Actuated g/C Ratio	0.06	0.19		0.19	0.32	0.32	0.09	0.39		0.04	0.33	
v/c Ratio	1.18	0.88		0.98	1.14	0.99	0.53	1.21		0.85	0.76	
Control Delay	127.4	63.5		100.0	113.3	85.2	70.1	138.8		110.7	44.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	127.4	63.5		100.0	113.3	85.2	70.1	138.8		110.7	44.3	
LOS	F	E		F	F	F	E	F		F	D	
Approach Delay		74.5			104.8			135.5			52.0	
Approach LOS		E			F			F			D	
Queue Length 50th (m)	-32.7	74.0		78.1	~188.1	113.5	19.6	~251.8		14.1	96.6	
Queue Length 95th (m)	m#29.5	m68.1		#135.5	#230.1	#181.3	36.2	#294.4		#31.1	120.9	
Internal Link Dist (m)		794.8			323.7			145.3			127.9	
Turn Bay Length (m)	125.0			118.0		184.0	117.0			74.0		
Base Capacity (vph)	91	586		308	1058	448	149	1263		124	1061	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	1.18	0.88		0.98	1.14	0.99	0.53	1.21		0.85	0.76	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated

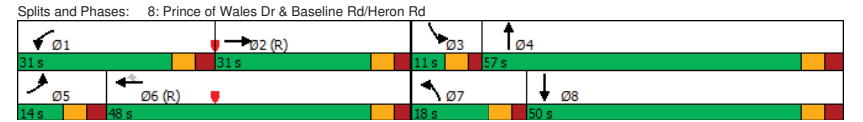
Lanes, Volumes, Timings

8: Prince of Wales Dr & Baseline Rd/Heron Rd

2034 Future Total

PM Peak Hour

Maximum v/c Ratio: 1.21	Intersection LOS: F
Intersection Signal Delay: 101.4	ICU Level of Service H
Intersection Capacity Utilization 112.4%	
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.	
m Volume for 95th percentile queue is metered by upstream signal.	



# Appendix K

Synchro Worksheets – Fisher Avenue at Baseline Road Without Baseline Rapid Transit

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Total-without BRT  
AM Peak Hour

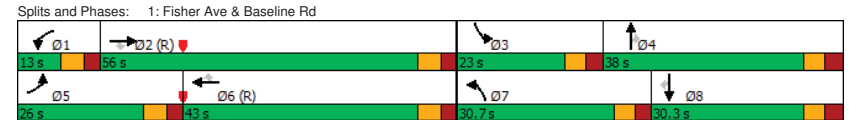
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	126	1294	152	41	1096	141	245	516	106	132	394	93
Future Volume (vph)	126	1294	152	41	1096	141	245	516	106	132	394	93
Satd. Flow (prot)	1658	3252	1469	1642	3252	1455	1658	3252	1483	1658	3221	1483
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1654	3252	1401	1633	3252	1416	1636	3252	1414	1650	3221	1418
Satd. Flow (RTOR)			180				232			181		
Lane Group Flow (vph)	126	1294	152	41	1096	141	245	516	106	132	394	93
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3		8
Permitted Phases			2			6			4			8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.3	29.1	29.1	11.3	29.1	29.1	10.9	30.3	30.3	10.9	30.3	30.3
Total Split (s)	26.0	56.0	56.0	13.0	43.0	43.0	30.7	38.0	38.0	23.0	30.3	30.3
Total Split (%)	20.0%	43.1%	43.1%	10.0%	33.1%	33.1%	23.6%	29.2%	29.2%	17.7%	23.3%	23.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.4	2.4	2.6	2.4	2.4	2.6	3.0	3.0	2.6	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.1	6.1	6.3	6.1	6.1	5.9	6.3	6.3	5.9	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	None	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	14.9	57.5	57.5	6.9	47.2	47.2	22.6	28.8	28.8	14.5	20.7	20.7
Actuated g/C Ratio	0.11	0.44	0.44	0.05	0.36	0.36	0.17	0.22	0.22	0.11	0.16	0.16
v/c Ratio	0.67	0.90	0.21	0.47	0.93	0.21	0.85	0.72	0.23	0.71	0.77	0.22
Control Delay	71.5	45.1	2.7	82.9	29.1	9.0	77.8	52.6	1.2	76.5	62.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.5	45.1	2.7	82.9	29.1	9.0	77.8	52.6	1.2	76.5	62.5	1.2
LOS	E	D	A	F	C	A	E	D	A	E	E	A
Approach Delay		43.1			28.6			53.4			56.3	
Approach LOS		D			C			D			E	
Queue Length 50th (m)	31.4	~178.5	0.0	8.2	152.9	18.2	60.2	63.9	0.0	32.8	51.3	0.0
Queue Length 95th (m)	50.4	#229.9	8.6	m6.3	m97.3	m10.4	#97.9	82.0	0.0	53.7	67.1	0.0
Internal Link Dist (m)		70.6			585.3			86.9			77.9	
Turn Bay Length (m)	124.5		58.5	134.0		91.5			85.0	65.0		60.0
Base Capacity (vph)	251	1437	719	90	1180	661	316	792	481	218	594	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.90	0.21	0.46	0.93	0.21	0.78	0.65	0.22	0.61	0.66	0.21

Intersection Summary	
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	119 (92%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle:	115
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Total-without BRT  
AM Peak Hour

Maximum v/c Ratio: 0.93	Intersection LOS: D
Intersection Signal Delay: 42.8	ICU Level of Service F
Intersection Capacity Utilization 91.6%	
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.	
m Volume for 95th percentile queue is metered by upstream signal.	



Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Total-without BRT  
PM Peak Hour

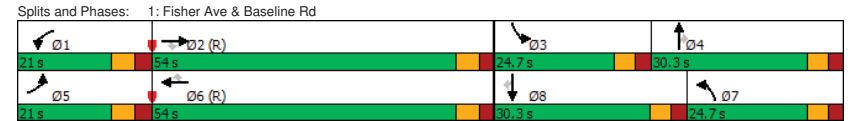
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↔	↕	↕	↔	↕	↕	↔	↕	↕
Traffic Volume (vph)	90	1342	257	185	1259	179	195	396	97	154	681	148
Future Volume (vph)	90	1342	257	185	1259	179	195	396	97	154	681	148
Satd. Flow (prot)	1658	3283	1483	1642	3316	1483	1658	3316	1455	1658	3283	1483
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1652	3283	1401	1631	3316	1425	1643	3316	1396	1639	3283	1391
Satd. Flow (RTOR)			127			154			129			129
Lane Group Flow (vph)	90	1342	257	185	1259	179	195	396	97	154	681	148
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6			4			8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	11.3	29.2	29.2	11.3	29.2	29.2	10.9	30.3	30.3	10.9	30.3	30.3
Total Split (s)	21.0	54.0	54.0	21.0	54.0	54.0	24.7	30.3	30.3	24.7	30.3	30.3
Total Split (%)	16.2%	41.5%	41.5%	16.2%	41.5%	41.5%	19.0%	23.3%	23.3%	19.0%	23.3%	23.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.5	2.5	2.6	2.5	2.5	2.6	2.5	2.5	2.6	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.2	6.2	6.3	6.2	6.2	5.9	5.8	5.8	5.9	5.8	5.8
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	11.8	47.8	47.8	15.6	51.6	51.6	17.9	26.3	26.3	16.1	24.5	24.5
Actuated g/C Ratio	0.09	0.37	0.37	0.12	0.40	0.40	0.14	0.20	0.20	0.12	0.19	0.19
v/c Ratio	0.60	1.11	0.43	0.94	0.96	0.27	0.86	0.59	0.25	0.75	1.10	0.40
Control Delay	72.6	100.9	17.5	107.1	55.3	7.3	86.7	51.5	4.7	77.2	115.7	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.6	100.9	17.5	107.1	55.3	7.3	86.7	51.5	4.7	77.2	115.7	14.0
LOS	E	F	B	F	E	A	F	D	A	E	F	B
Approach Delay		86.7			55.9			54.9			94.3	
Approach LOS		F			E			D			F	
Queue Length 50th (m)	22.4	~206.8	23.7	48.1	166.8	4.0	49.1	49.0	0.0	38.3	~104.1	4.1
Queue Length 95th (m)	39.5	#249.1	47.3	#95.9	#223.8	19.8	#87.4	66.7	7.6	60.8	#141.8	23.0
Internal Link Dist (m)		45.3			582.5			85.7			67.0	
Turn Bay Length (m)	138.0		50.0	134.0		91.5	127.0		85.0	65.0		60.0
Base Capacity (vph)	187	1207	595	197	1315	658	239	670	385	239	618	366
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	1.11	0.43	0.94	0.96	0.27	0.82	0.59	0.25	0.64	1.10	0.40

Intersection Summary												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 123 (95%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 135												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings  
1: Fisher Ave & Baseline Rd

2034 Future Total-without BRT  
PM Peak Hour

Maximum v/c Ratio: 1.11	Intersection LOS: E
Intersection Signal Delay: 73.8	ICU Level of Service G
Intersection Capacity Utilization 101.5%	
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.	



# Appendix L

MMLOS Analysis



Multi-Modal Level of Service - Intersections Form

Consultant Scenario Comments	CGH Transportation Inc. Existing/Future	Project Date	2021-083 10/24/2022
------------------------------	--	--------------	------------------------

INTERSECTIONS		Fisher Avenue at Baseline Road (Existing)				Prince of Wales Drive at Baseline Road/Heron Road (Existing)				Fisher Avenue at Baseline Road (Future)				Prince of Wales Drive at Baseline Road/Heron Road (Future)				Fisher Avenue at Deer Park Road/Dynes Road				
Crossing Side		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	
Pedestrian	Lanes	6	7	6	7	7	6	9	9	7	9	10+	10+	7	7	9	9	5	5	3	3	
	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	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	Median > 2.4 m	Median > 2.4 m	Median > 2.4 m	Median > 2.4 m	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	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Permissive	Permissive	Permissive	Permissive	
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	
	Right Turns on Red (RTorR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR prohibited	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Right Turn Channel	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conv't'l without Receiving Lane	Conv't'l without Receiving Lane	Conventional with Receiving Lane	Conv't'l without Receiving Lane	No Channel	No Channel	No Channel	No Channel	Conv't'l without Receiving Lane	Conv't'l without Receiving Lane	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	15-25m	15-25m	15-25m	15-25m	>25m	>25m	>25m	>25m	15-25m	15-25m	15-25m	15-25m	15-25m	>25m	>25m	>25m	10-15m	10-15m	15-25m	10-15m	
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings
	PETSI Score	27	11	27	11	16	32	-20	-17	13	-20	-26	-26	25	25	-9	-9	40	40	71	73	
	Ped. Exposure to Traffic LoS	F	F	F	F	F	E	#N/A	#N/A	F	#N/A	#N/A	#N/A	F	F	F	F	E	E	C	C	
	Cycle Length	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	95	95	95	95	
	Effective Walk Time	7	7	21	34	10	10	11	19	9	7	28	31	10	10	11	19	83	83	76	76	
	Average Pedestrian Delay	58	58	46	35	55	55	54	47	56	58	40	38	55	55	54	47	1	1	2	2	
Pedestrian Delay LoS	E	E	E	D	E	E	E	E	E	E	D	D	E	E	E	E	A	A	A	A		
Level of Service	F	F	F	F	F	E	#N/A	#N/A	F	#N/A	#N/A	#N/A	F	F	F	F	E	E	C	C		
Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	
	Right Turn Lane Configuration	Not Applicable	Not Applicable	> 50 m	> 50 m	Not Applicable	Not Applicable	> 50 m	> 50 m	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	
	Right Turning Speed	Not Applicable	Not Applicable	>25 km/h	>25 km/h	Not Applicable	Not Applicable	>25 km/h	>25 km/h	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	
	Cyclist relative to RT motorists	Not Applicable	Not Applicable	F	F	Not Applicable	Not Applicable	F	F	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	
	Separated or Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Separated	Separated	Mixed Traffic	Mixed Traffic	Separated	Separated	Separated	Separated	Separated	Separated	Separated	Separated	Separated	Separated	Separated	Separated	
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	
	Operating Speed	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	
Left Turning Cyclist	F	F	F	F	F	F	F	F	A	A	A	A	A	A	A	A	A	A	A	A		
Level of Service	F	F	F	F	F	F	F	F	A	A	A	A	A	A	A	A	A	A	A	A		
Transit	Average Signal Delay	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	≤ 20 sec	≤ 20 sec	-	-	
	Level of Service	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	C	C	-	-	
Truck	Effective Corner Radius	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	-	-	-	-	
	Number of Receiving Lanes on Departure from Intersection	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	-	-	-	-	
Auto	Volume to Capacity Ratio	> 1.00				> 1.00				> 1.00				> 1.00				0.61 - 0.70				
	Level of Service	F				F				F				F				B				