

780 Baseline Road, 7-9 Hilliard Avenue

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report (ZBA) (Revision #3)

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1 Screening

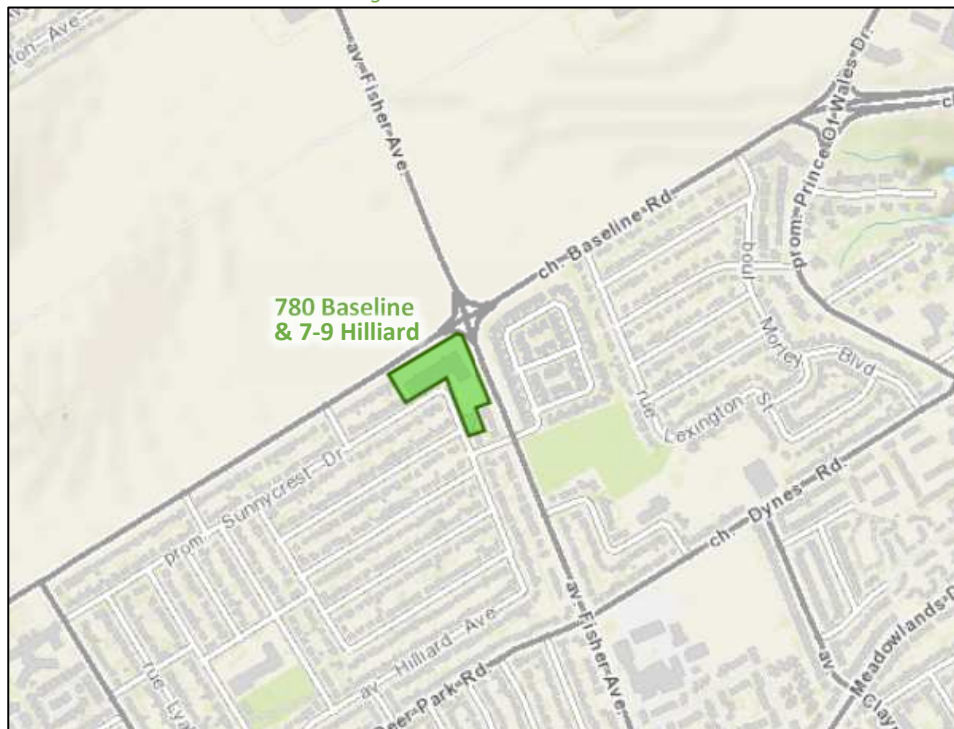
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is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

2 Existing and Planned Conditions

2.1 Proposed Development

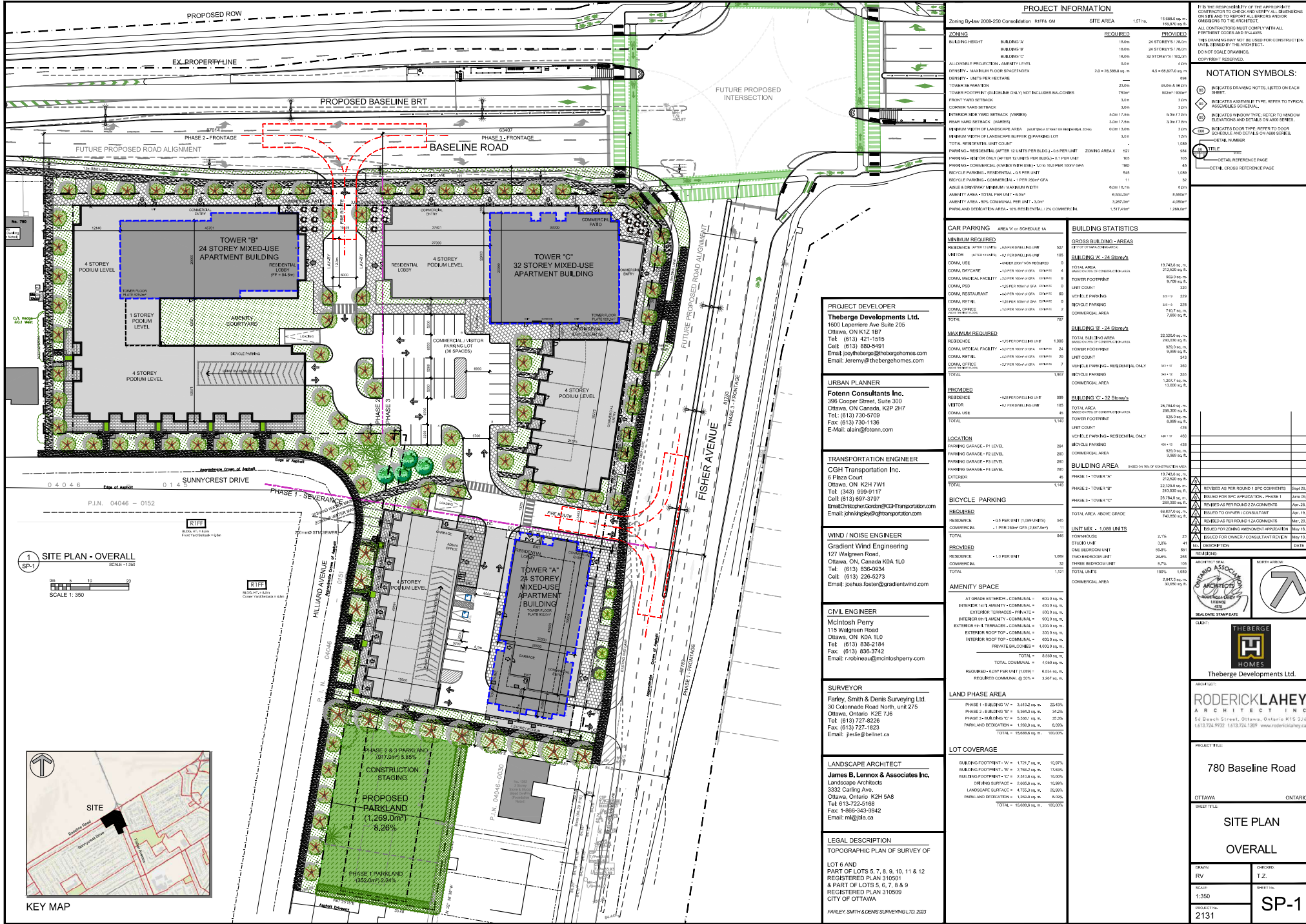
The existing site, located at 780 Baseline Road, is zoned as General Mixed Use (GM) and includes a business strip consisting of retail, service, and restaurant land uses with surrounding surface parking lots. The proposed development is anticipated to include a total of 1,089 dwelling units and 30,650 sq. ft of commercial space in three mixed-used buildings to be constructed across multiple phases with an anticipated full build-out and occupancy horizon of 2034. The first phase is understood to consist of a 24-storey mixed-use building on the southern portion 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 28-storey tower on the west side of the site, and one 32-storey tower at the Baseline Road and Fisher Avenue intersection, each on four-storey podia. The development proposes a right-in-only access on Baseline Road, the conversion of an existing full-movements access on Fisher Avenue to right-in/right-out via the extension of the median, and a new full-movement access via a future extension of the auxiliary left-turn lane on Fisher Avenue. A total of 999 residential, 105 visitor, 45 commercial vehicle parking spaces, and 1089 residential and 32 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 24, 2023

Figure 2: Concept Plan



PROJECT INFORMATION		REQUIRED	PROVIDED
ZONING	By-law 2008-250 Commercial - RUFFLE 04R		15,688.04 m ² (68,345 sq. ft.)
BUILDING HEIGHT	BUILDING 'A'	15.0m	24 STOREYS / 76.2m
	BUILDING 'B'	15.0m	24 STOREYS / 76.2m
	BUILDING 'C'	15.0m	32 STOREYS / 103.0m
ALLOWABLE PROJECTION - AMENITY LEVEL		0.2m	4.3 - 45.877.0m
DENSITY - MAXIMUM GROSS FLOOR AREA		2.2 + 25,000.0 m ²	954
DENSITY - UNITS PER HECTARE			45.0m x 96.2m
TOWER SEPARATION		23.0m	92.0m / 303.0ft
TOWER FOOTPRINT (GROUNDSHED ONLY) - EXCLUDES BALCONIES		789m ²	32.9m x 24.1m
FRONT YARD SETBACK		3.2m	3.2m
CORNER YARD SETBACK		5.0m	5.0m
INTERIOR SIDE YARD SETBACK (VARIES)		5.0m / 7.5m	5.0m / 7.5m
FRONT YARD SETBACK (VARIES)		3.0m / 7.5m	3.0m / 7.5m
MINIMUM WIDTH OF LANDSCAPE AREA (EXCLUDES SETBACKS AND DRIVEWAYS)		6.0m / 3.0m	6.0m / 3.0m
MINIMUM WIDTH OF LANDSCAPE BUFFER @ PARKING LOT		3.0m	3.0m
MINIMUM WIDTH OF LANDSCAPE BUFFER @ PER UNIT		1.0m	1.0m
PARKING - RESIDENTIAL AFTER 12 UNITS PER BUILDING - 0.5 PER UNIT		103	1,089
PARKING - COMMERCIAL (VARIES W/ USE) - 1.0m TO 10.0m PER 100M ² GFA		780	45
BIKECYCLE PARKING - RESIDENTIAL - 0.5 PER UNIT		545	5,085
BIKECYCLE PARKING - COMMERCIAL - 1 PER 250M ² GFA		11	30
AMENITY & BREAKDOWN (MINIMUM MAXIMUM WIDTH AND SETBACK AREA - TOTAL PER UNIT - 4.0M ²)		3,247.0m ²	4,007.0m ²
PARKLAND DEDICATION AREA - 10% RESIDENTIAL / 2% COMMERCIAL		1,517.5m ²	1,583.0m ²

NOTATION SYMBOLS:

- ⊙ INDICATES ASSUMING NOTES REFER TO EACH SHEET.
- ⊕ INDICATES ASSUMING TYPE: REFER TO FINAL ASSEMBLY SCHEDULE.
- ⊖ INDICATES INVOID TYPE: REFER TO INVOID EXCLUDING AND DETAILS ON AVOID DETAILS.
- ⊗ INDICATES INVOID TYPE: REFER TO INVOID SCHEDULE AND DETAILS ON AVOID DETAILS.
- ① DETAIL NUMBER
- ② TITLE
- ③ DETAIL REFERENCE PAGE
- ④ DETAIL CROSS REFERENCE PAGE

CAR PARKING	AREA "X" ON SCHEDULE "A"	BUILDING STATISTICS
MINIMUM REQUIRED		CROSS BUILDING AREAS (TOP OF PARKING GARAGE)
RESIDENCE	+0.5 PER GARAGE UNIT	TOTAL AREA
VEHICLE	+0.1 PER GARAGE UNIT	BUILDING 'A' - 24 Storeys
COMM. OFFICE	+0.2 PER 100M ² GFA	TOTAL AREA
COMM. DAYCARE	+0.2 PER 100M ² GFA	TOWER FOOTPRINT
COMM. MEDICAL FACILITY	+0.2 PER 100M ² GFA	COMM. OFFICE
COMM. RESTAURANT	+0.2 PER 100M ² GFA	COMM. RETAIL
COMM. RETAIL	+0.2 PER 100M ² GFA	COMM. OFFICE
COMM. OFFICE	+0.2 PER 100M ² GFA	TOTAL
TOTAL	707	

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CIVIL ENGINEER
McIntosh Perry 115 Walgreen Road Ottawa, ON K0A 1L0 Tel: (613) 836-2184 Fax: (613) 836-3742 Email: r.robinson@mcintoshperry.com

SURVEYOR
Farley, Smith & Denis Surveying Ltd. 30 Colonnade Road North, unit 275 Ottawa, Ontario K2E 7J6 Tel: (613) 727-8228 Fax: (613) 727-1823 Email: jsteele@bellnet.ca

LANDSCAPE ARCHITECT
James B. Lennox & Associates Inc. Landscape Architects 3332 Carling Ave. Ottawa, Ontario K2H 5A8 Tel: (613) 723-5168 Fax: 1-866-343-3942 Email: m@jbla.ca

LEGAL DESCRIPTION
TOPOGRAPHIC PLAN OF SURVEY OF LOT 6 AND PART OF LOTS 5, 7, 8, 9, 10, 11 & 12 REGISTERED PLAN 310509 & PART OF LOTS 5, 6, 7, 8 & 9 REGISTERED PLAN 310509 CITY OF OTTAWA

LOT COVERAGE	
BUILDING FOOTPRINT 'A'	1,771.2 m ² / 15.8%
BUILDING FOOTPRINT 'B'	2,762.0 m ² / 15.8%
BUILDING FOOTPRINT 'C'	2,510.0 m ² / 15.8%
DRIVEWAY SURFACE	2,868.0 m ² / 18.9%
LANDSCAPE SURFACE	4,753.0 m ² / 30.9%
PARKLAND DEDICATION	1,269.0 m ² / 8.2%
TOTAL	15,688.0 m ² / 100.0%

MINIMUM REQUIRED	PROVIDED
RESIDENCE	100%
VEHICLE	100%
COMM. OFFICE	100%
COMM. DAYCARE	100%
COMM. MEDICAL FACILITY	100%
COMM. RESTAURANT	100%
COMM. RETAIL	100%
COMM. OFFICE	100%
TOTAL	100%

LOCATION	
PARKING GARAGE - P1 LEVEL	264
PARKING GARAGE - P2 LEVEL	280
PARKING GARAGE - P3 LEVEL	280
EXTERIOR	1,749
TOTAL	2,873

BIKECYCLE PARKING	
RESIDENCE	545
COMMERCIAL	11
TOTAL	556

AMENITY SPACE	
AT GRADE EXTERIOR - COMMUNAL	600.0 m ²
INTERIOR RECREATION - COMMUNAL	400.0 m ²
EXTERIOR TERRACES - PRIVATE	500.0 m ²
INTERIOR RECREATION - COMMUNAL	500.0 m ²
EXTERIOR RECREATION - COMMUNAL	1,200.0 m ²
EXTERIOR ROOF TOP - COMMUNAL	300.0 m ²
INTERIOR ROOF TOP - COMMUNAL	600.0 m ²
PRIVATE BALCONIES	4,000.0 m ²
TOTAL	8,100.0 m ²
TOTAL COMMUNAL	4,000.0 m ²
REQUIRED - 4.0M ² PER UNIT @ 0.099	6,034.0 m ²
REQUIRED - COMMUNAL @ 0.2%	3,247.0 m ²

UNIT MIX - 1,000 UNITS	
TOWNHOUSE	2.1%
RESIDUAL	3.3%
ONE BEDROOM UNIT	56.1%
TWO BEDROOM UNIT	24.6%
THREE BEDROOM UNIT	9.7%
TOTAL UNITS	100%
COMMERCIAL AREA	2,812.0 m ² / 36.0%

LAND PHASE AREA	
PHASE 1 - BUILDING 'A'	3,512.0 m ² / 22.4%
PHASE 2 - BUILDING 'B'	5,040.0 m ² / 32.2%
PHASE 3 - BUILDING 'C'	5,536.0 m ² / 35.4%
PARKLAND DEDICATION	1,589.0 m ² / 10.2%
TOTAL	15,688.0 m ² / 100.0%

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IT IS THE RESPONSIBILITY OF THE APPLICANT/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. THESE DRAWINGS MAY NOT BE USED FOR CONSTRUCTION UNLESS SIGNED BY THE ARCHITECT. DO NOT SCALE DRAWINGS. COMMENT: RESIDENCE

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COMM. RESTAURANT	100%
COMM. RETAIL	100%
COMM. OFFICE	100%
TOTAL	100%

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TOTAL	15,688.0 m ² / 100.0%

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 and bike lanes 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. Each approach consists of an auxiliary left-turn lane, two through lanes, and a channelized auxiliary 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 24, 2023

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 and Deer Park Road east of Millbrook Crescent.

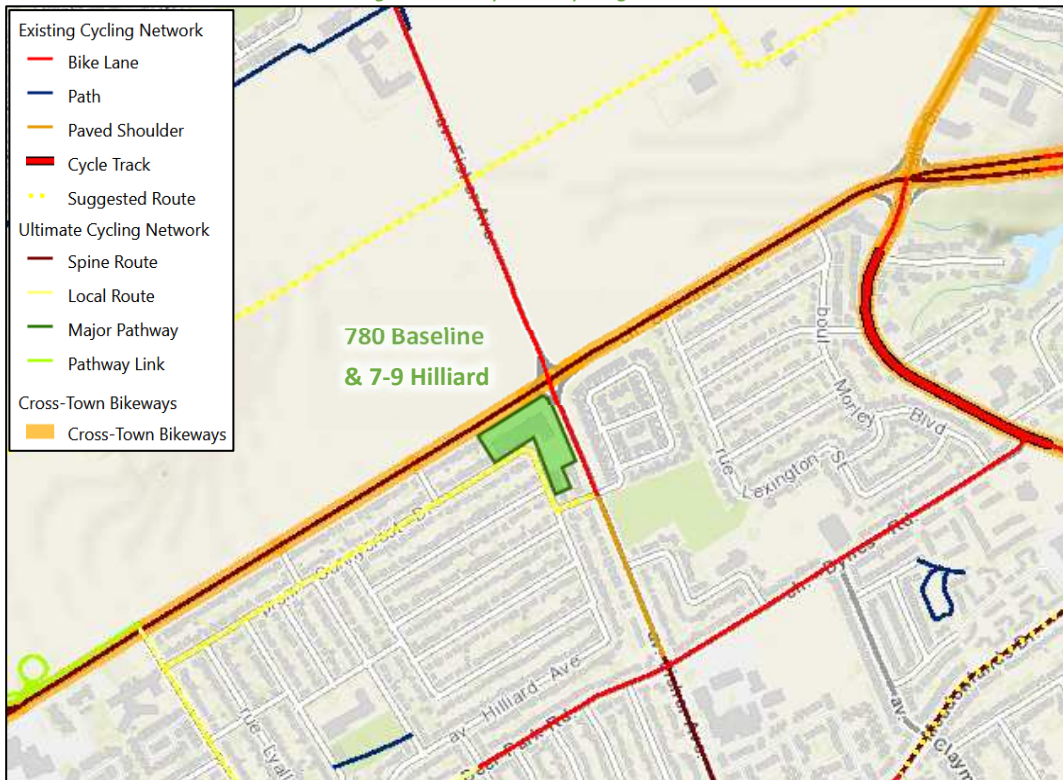
Fisher Avenue, Prince of Wales Drive, Baseline Road, and Heron Road are spine routes. Baseline Road, Heron Road and Prince of Wales Drive are cross-town bikeways. Malibu Terrace west of Fisher Avenue, Hilliard Avenue north of Malibu Terrace, Sunnycrest Drive, Deer Park Road, Dynes Road, and McCooey Lane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

Figure 4: Study Area Pedestrian Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 24, 2023

Figure 5: Study Area Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 24, 2023

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

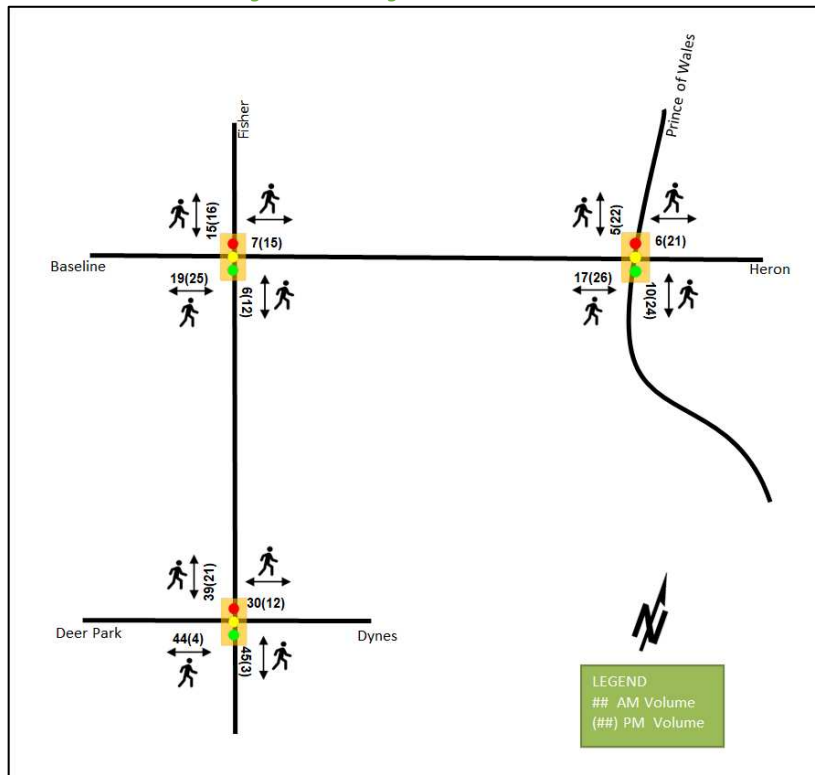
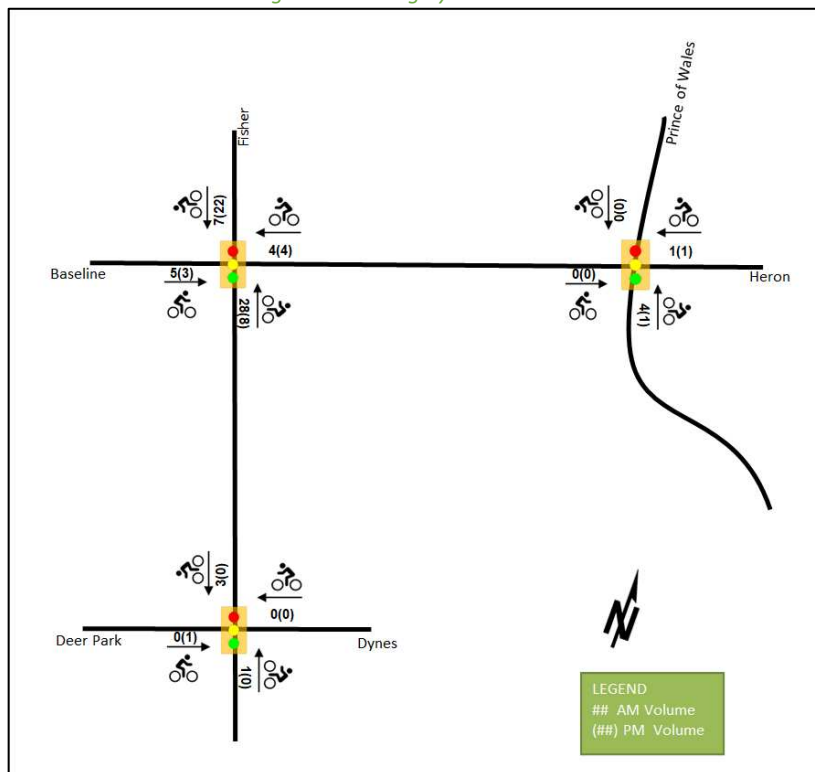


Figure 7: Existing Cyclist Volumes



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:

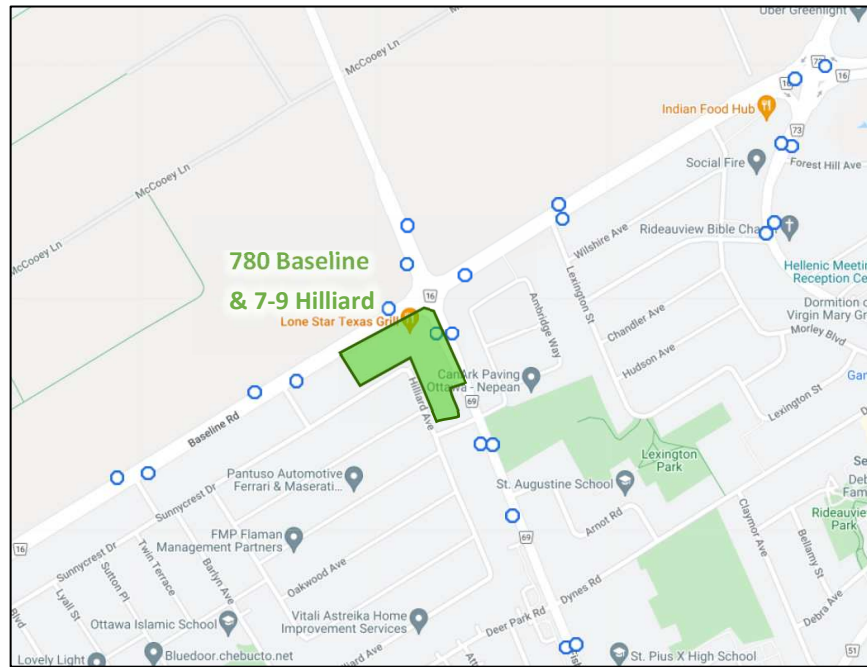
- Route # 86 – 15-minute service in the peak period/direction, 30-minute service all day
- Route # 88 – 10-12-minute service in the peak period/direction, 15-minute service all day
- Route # 89 – 15-minute service in the peak period/direction, 30-minute service all day

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

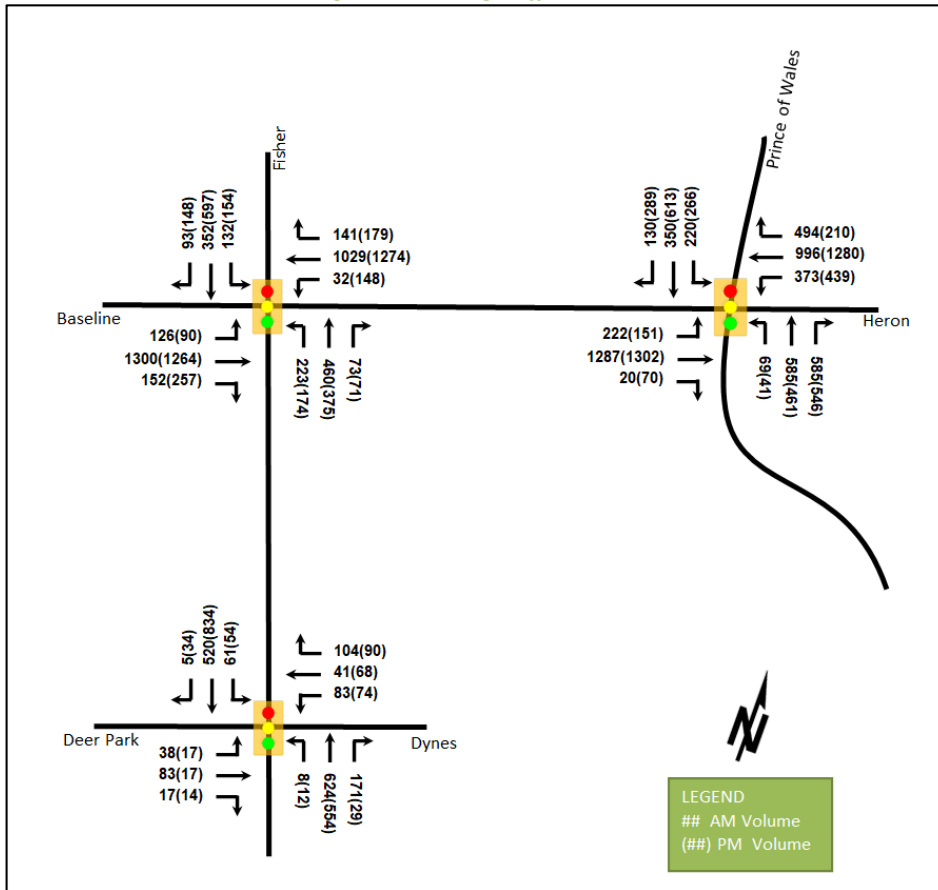


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Fisher Avenue at Baseline Road Signalized	EBL	B	0.70	73.0	55.3	B	0.64	74.7	43.2
	EBT	E	0.96	50.4	#272.2	F	1.16	117.8	#266.1
	EBR	A	0.23	3.8	12.2	A	0.47	17.2	51.0
	WBL	A	0.42	82.5	m5.3	D	0.90	101.1	#82.6
	WBT	E	0.99	34.5	m99.9	F	1.10	96.5	#268.1
	WBR	A	0.24	9.9	m12.9	A	0.31	9.1	25.0
	NBL	D	0.86	78.6	#100.0	D	0.85	86.3	#86.3
	NBT	C	0.73	53.6	81.1	B	0.63	53.3	70.8
	NBR	A	0.18	0.9	0.0	A	0.21	2.5	2.6
	SBL	C	0.76	79.3	#62.8	C	0.79	79.9	#72.4
	SBT	C	0.76	62.4	66.7	F	1.05	99.8	#138.3
	SBR	A	0.25	1.4	0.0	A	0.43	14.1	25.1
Overall	E	0.95	46.1	-	F	1.04	86.4	-	

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Prince of Wales Drive at Baseline Road/Heron Road Signalized	EBL	F	1.28	198.6	m#92.4	F	1.63	361.0	#107.8
	EBT/R	F	1.16	106.7	m#178.5	F	1.20	139.0	#206.3
	WBL	D	0.82	66.1	70.2	F	1.24	174.3	#114.8
	WBT	F	1.87	426.7	#268.6	F	1.59	305.7	#319.7
	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	F	1.05	71.4	#177.9	F	1.10	95.6	#196.2
	SBL	F	1.06	129.1	#120.1	F	1.13	144.4	#145.1
	SBT/R	A	0.53	37.8	78.7	E	0.96	61.8	#172.4
Overall	F	1.30	144.8	-	F	1.34	156.2	-	
Fisher Avenue at Deer Park Road/Dynes Road Signalized	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
	Overall	B	0.69	16.8	-	B	0.62	16.7	-

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, the eastbound through, westbound through, and southbound through movements are over theoretical capacity and may be subject to high delays and extended queues during PM peak hour. Extended queues may also be exhibited on the eastbound through, northbound left-turn, and southbound left-turn movements during the AM peak hour, and on the westbound left-turn, northbound left-turn, and southbound left-turn movements during both peak hours. High delays may be experienced on the westbound left-turn movement during the AM and PM peak hours 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	%
		133	100%
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

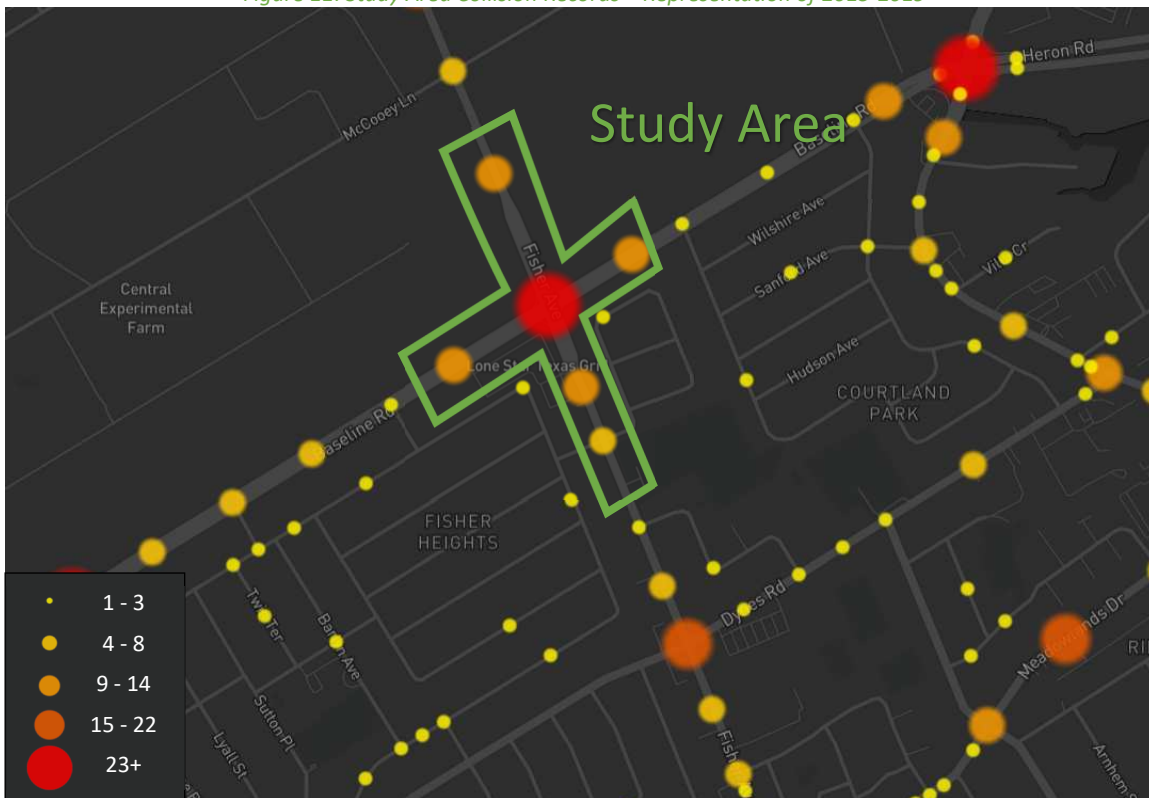


Table 4: Summary of Collision Locations, 2015-2019

	Number	%
Intersections / Segments	133	100%
Fisher Ave @ Baseline Rd	81	61%
Fisher Ave @ Malibu Ter	7	5%
Baseline Rd btwn Marson St & Fisher Ave	12	9%
Baseline Rd btwn Fisher Ave & Lexington St	10	8%
Fisher Ave btwn McCooley Lane & Baseline Rd	13	10%
Fisher Ave btwn Baseline Rd & Malibu Ter	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 McCooley 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	%
Total Collisions		81	100%
Classification	Fatality	1	1%
	Non-Fatal Injury	9	11%
	Property Damage Only	71	88%
Initial Impact Type	Angle	2	2%
	Rear end	59	73%
	Sideswipe	11	14%
	Turning Movement	2	2%
	SMV Unattended	1	1%
	SMV Other	5	6%
	Other	1	1%
Road Surface Condition	Dry	60	74%
	Wet	7	9%
	Loose Snow	7	9%
	Slush	2	2%
	Packed Snow	2	2%
	Ice	3	4%
Pedestrian Involved		3	4%
Cyclists Involved		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. The City has developed a protected intersection design as part of the Baseline Road Rapid Transit Corridor project to improve active mode safety. No further examination is required as part of this study.

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

		Number	%
Total Collisions		12	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	4	33%
	Property Damage Only	8	67%
Initial Impact Type	Rear end	10	83%
	Sideswipe	2	17%
Road Surface Condition	Dry	7	58%
	Wet	4	33%
	Packed Snow	1	8%
Pedestrian Involved		0	0%
Cyclists Involved		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 and may also be influenced by private driveways accessing Baseline Road. 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 McCooey Lane and Baseline Road Collision Summary

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

The segment of Fisher Avenue between McCooey 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. Rear end collisions are typical of congested areas and possible collisions could be related to the northbound merging and bus stop. 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

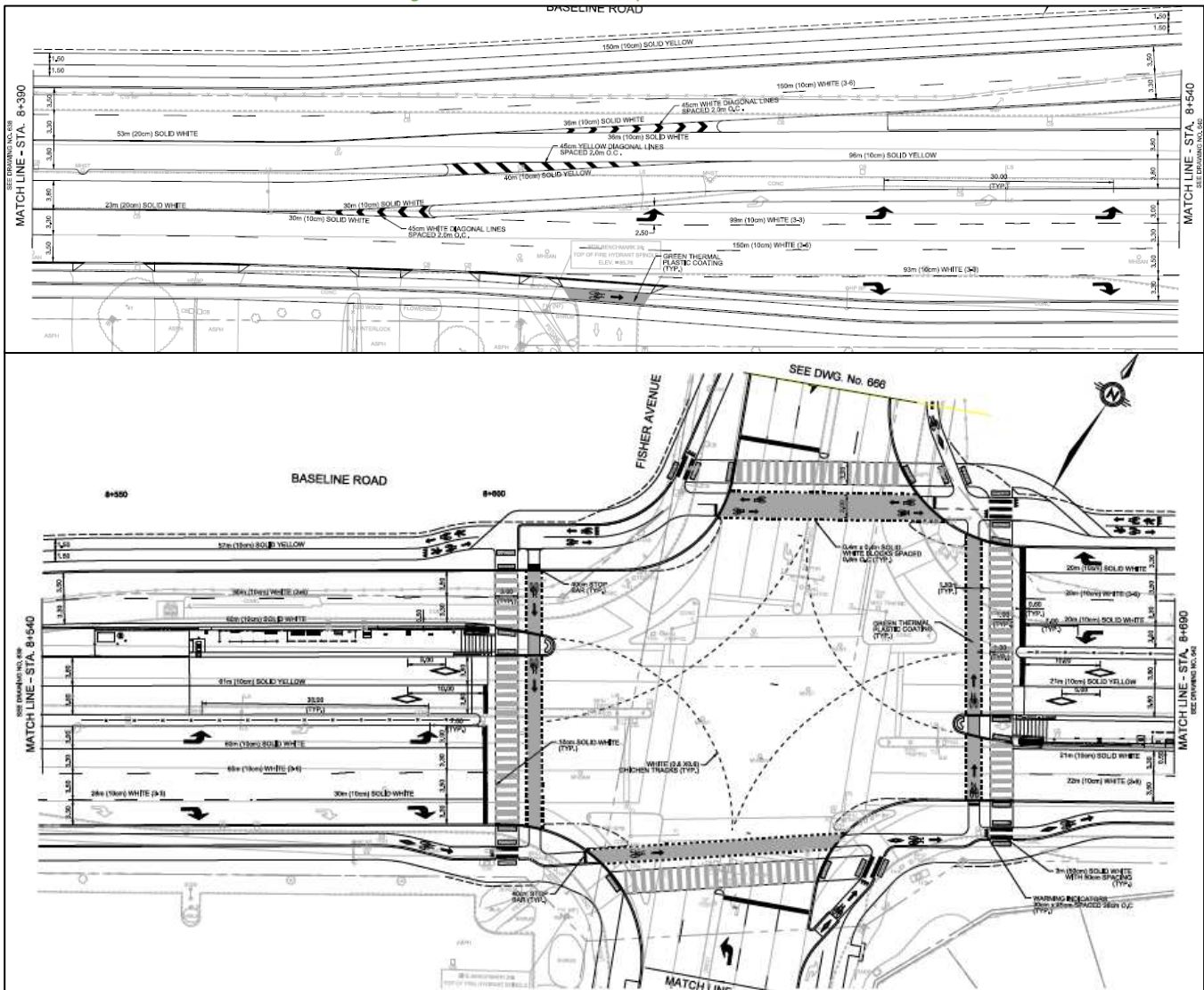
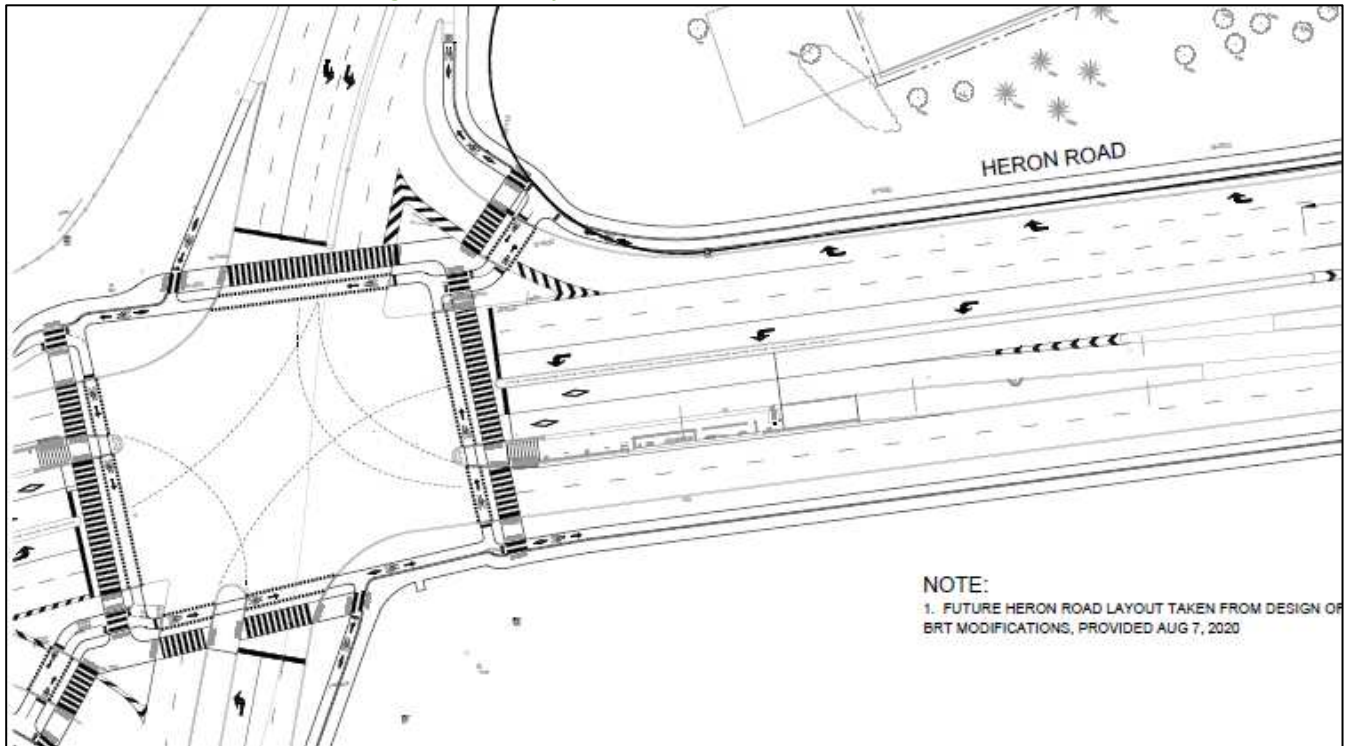


Figure 13: Prince of Wales Drive at Baseline Road/Heron Road



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
Design Review Component			
4.1 Development Design	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
4.2 Parking	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
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Required
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt

5 Development-Generated Travel Demand

5.1 Mode Shares

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
Auto Driver	41%	41%	71%	61%
Auto Passenger	6%	11%	19%	16%
Transit	42%	33%	1%	8%
Cycling	2%	2%	0%	1%
Walking	9%	13%	9%	14%
Total	100%	100%	100%	100%

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	9%	13%	9%	14%
Total	100%	100%	100%	100%

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	-	-
Strip Retail Plaza (<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)	1,089	270	601	871	568	412	980

Land Use	GFA (sq. ft.)	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Strip Retail Plaza (<40k sq. ft.)	30,650	56	37	93	130	130	260

Internal capture rates from the ITE Trip Generation Handbook 3rd 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%	37	84	121	29%	73	52	125
	Auto Passenger	6%	8	17	25	11%	27	20	47
	Transit	52%	77	172	249	43%	115	83	198
	Cycling	4%	6	14	20	4%	11	8	19
	Walking	8%	14	31	45	13%	38	28	66
	Total	100%	142	318	460	100%	264	191	455
Retail (<40k sq. ft.)	Auto Driver	61%	9	6	15	51%	10	4	14
	Auto Passenger	19%	10	6	16	16%	20	18	38
	Transit	11%	6	4	10	18%	22	20	42
	Cycling	0%	0	0	0	1%	1	1	2
	Walking	9%	5	3	8	14%	17	15	32
	Pass-by	40%	-22	-15	-37	40%	-52	-52	-104
	Internal Capture	varies	-6	-3	-9	varies	-8	-20	-28
Total	100%	30	19	49	100%	70	58	128	
Total	Auto Driver	-	46	90	136	-	83	56	139
	Auto Passenger	-	18	23	41	-	47	38	85
	Transit	-	83	176	259	-	137	103	240
	Cycling	-	6	14	20	-	12	9	21
	Walking	-	19	34	53	-	55	43	98
	Total	-	172	337	509	-	334	249	583

As shown above, a total of 136 AM and 139 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%
Total	100%

5.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. 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
North	20% Fisher Ave (N) 10% Prince of Wales Dr (N)	20% Fisher Ave (N) 10% Prince of Wales Dr (N)
South	10% Fisher Ave (S) 15% Baseline Rd (W)	25% Fisher Ave (S)
East	20% Heron Rd (E)	20% Heron Rd (E)
West	20% Baseline Rd (W) 5% Fisher Ave (N)	20% Baseline Rd (W) 5% Fisher Ave (N)
Total	100%	100%

Figure 14: New Site Generation Auto Volumes

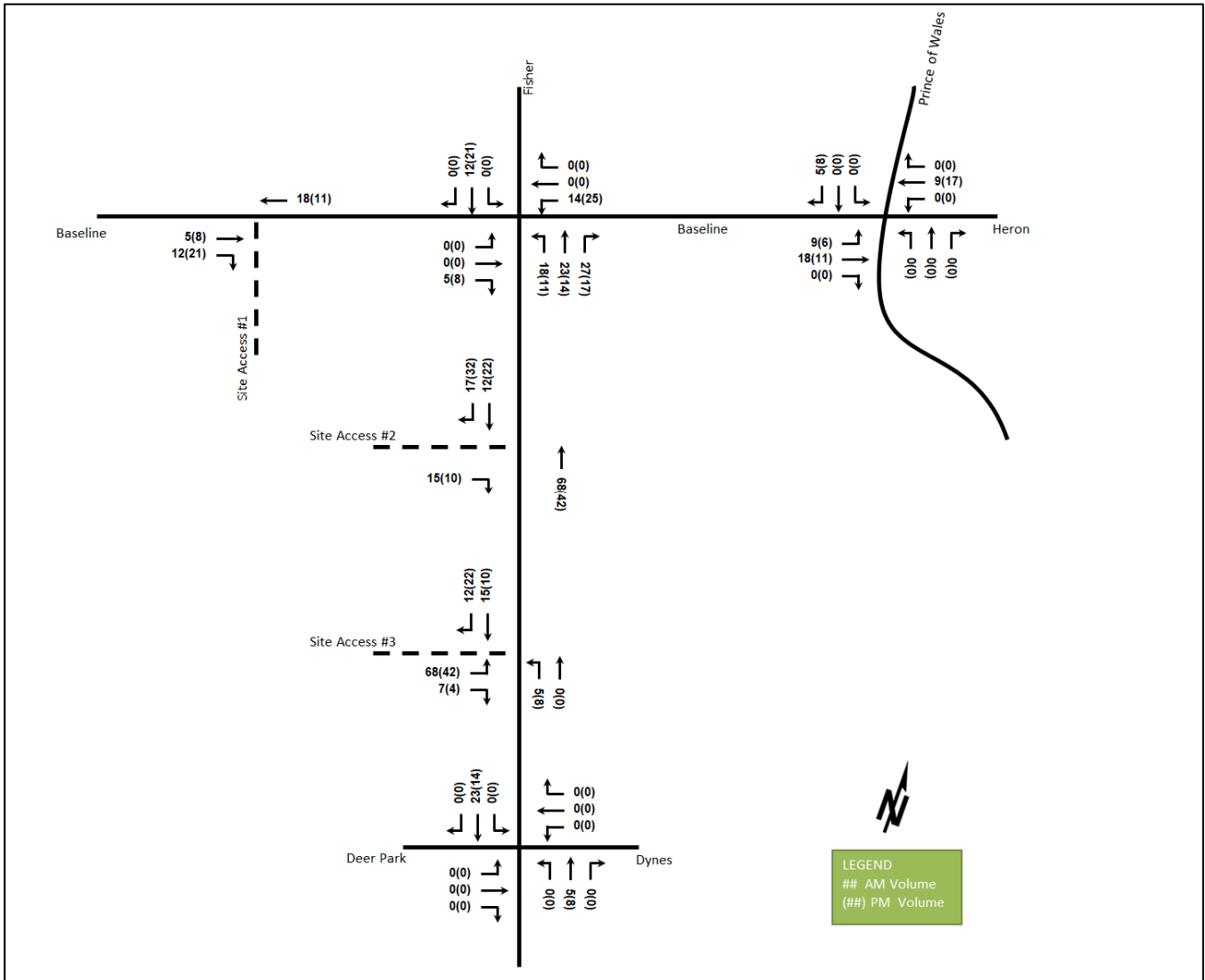
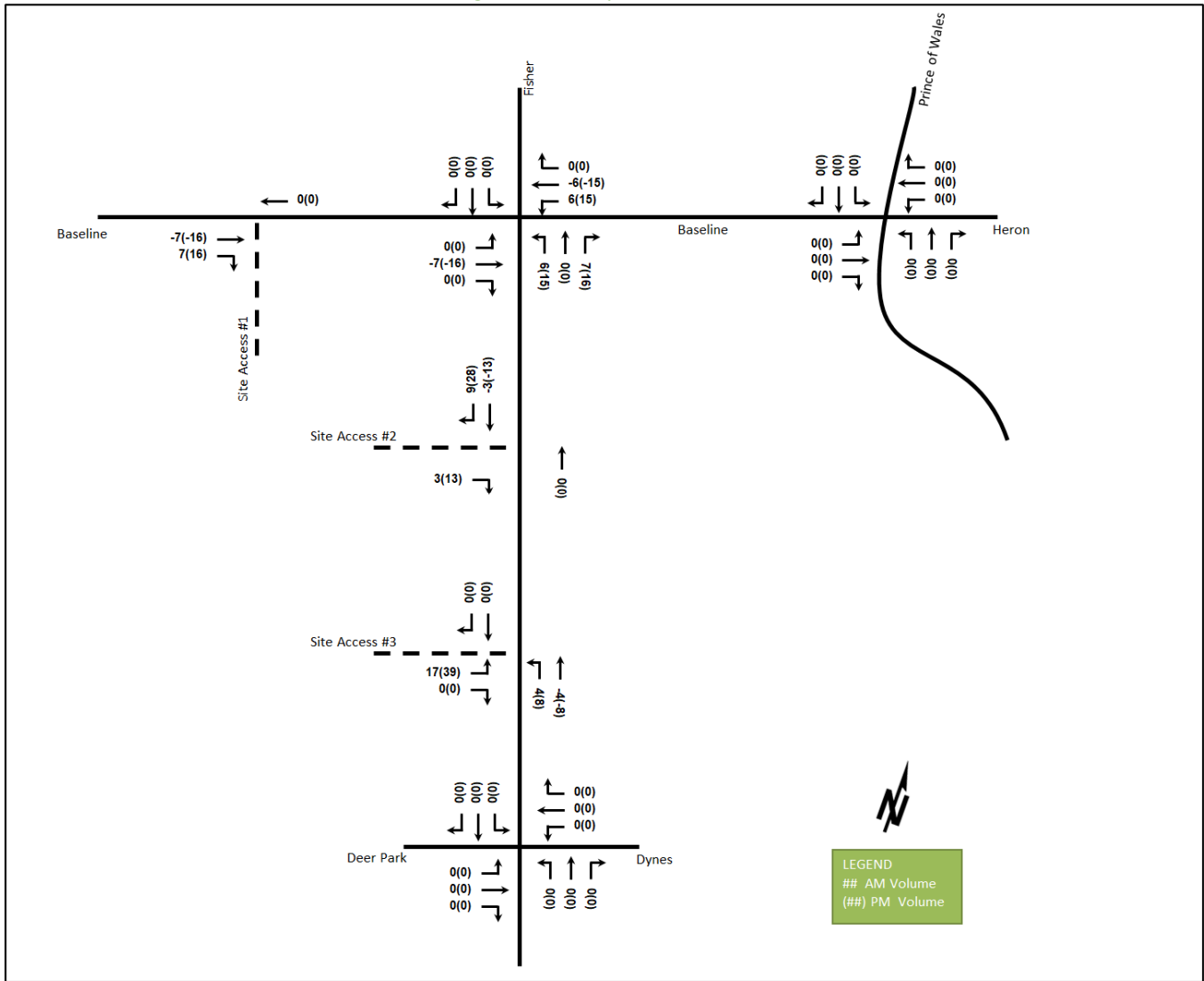


Figure 15: Pass-By Auto Volumes



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 trip generation land use and floor area, and the resultant 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.)
Strip Retail Plaza (<40k sq. ft.)	822 (ITE)	34,950

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.)”.

The existing site is estimated to produce 25 AM two-way primary auto trips in the AM peak hour and 60 two-way primary auto trips in the PM peak hour based on the existing land uses and the recommended area mode shares. Figure 16 illustrates the total vehicle volume reductions from the existing site land uses and Table 20 compares the estimated existing primary auto trips and forecasted site-generated primary auto trips.

Figure 16: Existing Retail Auto Volume Reductions

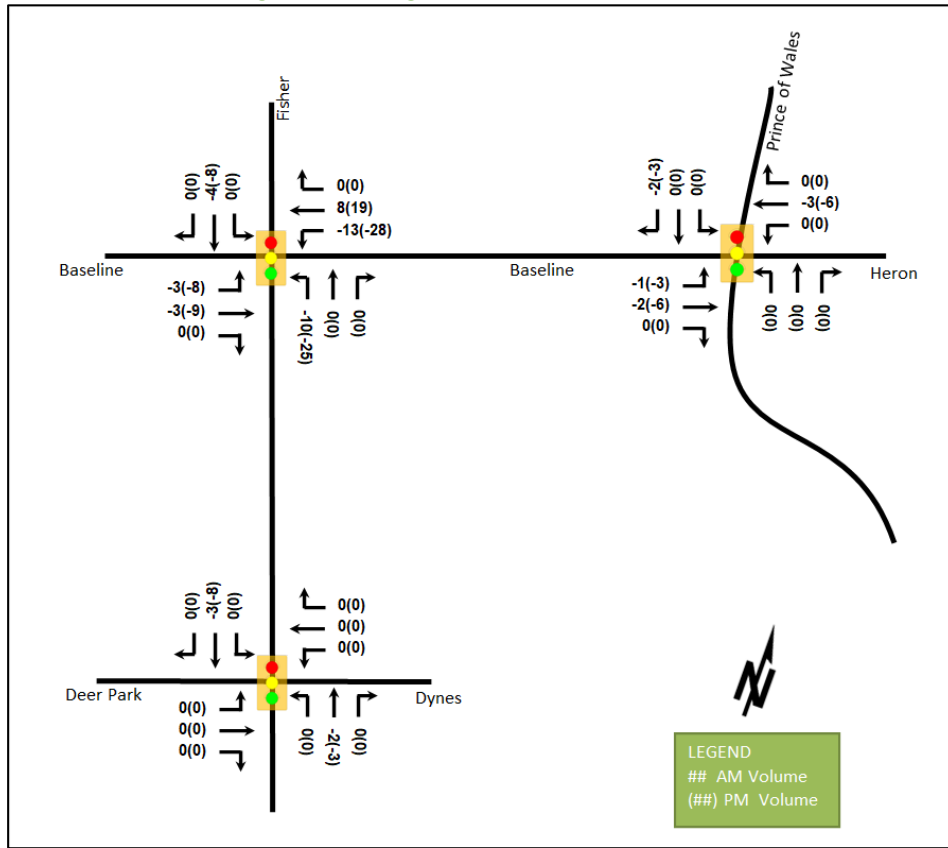


Table 20: Estimated Existing Auto Trip Volumes vs Forecasted Auto Trip Volumes

Scenario	AM Peak Hour				PM Peak Hour			
	Mode Share	In	Out	Total	Mode Share	In	Out	Total
Existing	Varies	15	10	25	Varies	30	30	60
Proposed	Varies	46	90	136	Varies	83	56	139
Difference	-	+31	+80	+111	-	+53	+26	+79

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

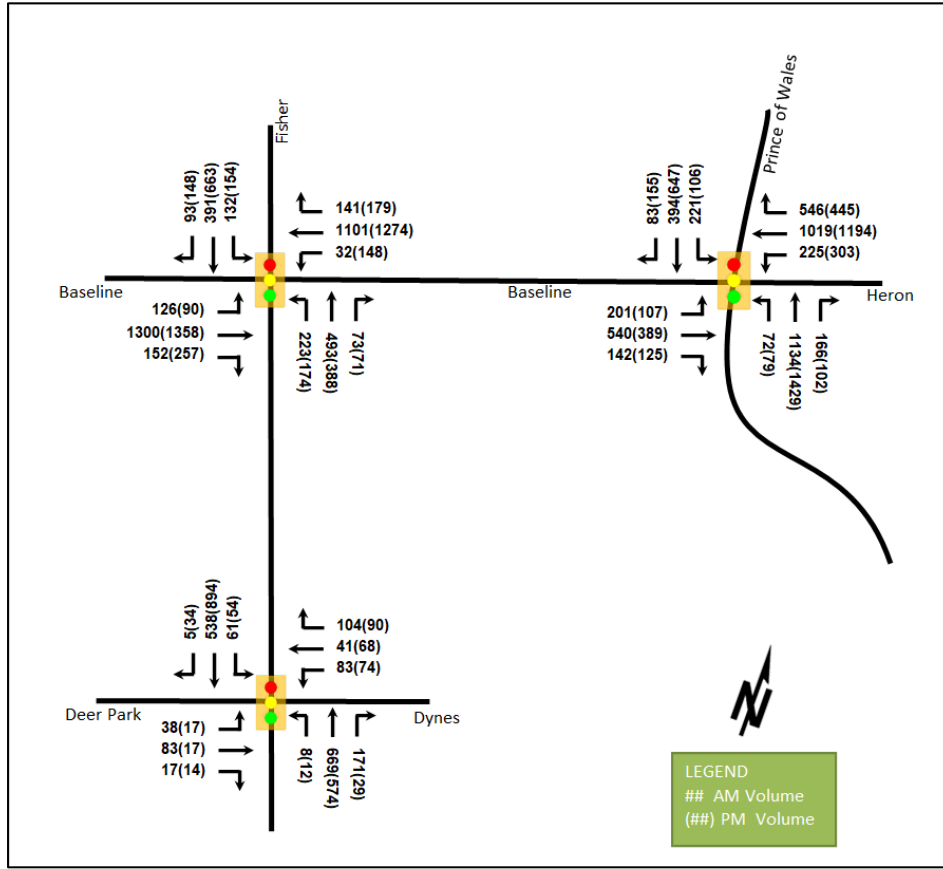


Table 21: 2034 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Fisher Avenue at Baseline Road Signalized	EBL	E	0.91	113.2	#73.4	E	0.92	131.2	#56.4
	EBT	E	0.96	53.7	#242.4	F	1.14	110.7	#255.3
	EBR	A	0.27	29.3	46.0	A	0.52	37.2	78.4
	WBL	A	0.50	65.5	m10.6	F	1.10	128.7	m#46.6
	WBT	E	1.00	94.9	m#169.6	E	0.99	62.5	m123.2
	WBR	A	0.29	66.5	m41.0	A	0.32	42.2	m33.9
	NBL	E	0.95	102.1	#105.9	F	1.09	152.8	#96.8
	NBT/R	B	0.64	44.7	85.6	A	0.53	42.8	69.7
	SBL	C	0.73	78.9	#55.0	F	1.02	136.1	#84.7
	SBT/R	B	0.64	47.4	74.6	E	0.96	69.3	#146.7
Overall	E	0.93	67.2	-	-	F	1.07	81.9	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Prince of Wales Drive at Baseline Road/Heron Road <i>Signalized</i>	EBL	F	1.20	151.1	m#75.7	F	1.18	126.9	m#28.5
	EBT/R	D	0.83	72.3	m105.2	D	0.88	64.2	m67.1
	WBL	E	0.95	101.6	#107.1	E	0.98	100.0	#135.5
	WBT	F	1.02	78.7	#186.8	F	1.13	110.9	#228.2
	WBR	F	1.24	165.2	#240.9	E	0.99	83.4	#180.7
	NBL	A	0.53	70.1	32.9	A	0.53	70.1	36.2
	NBT/R	F	1.19	131.6	#252.8	F	1.21	139.6	#294.7
	SBL	F	1.26	204.0	#62.3	D	0.85	110.7	#31.1
	SBT/R	A	0.45	37.3	71.3	C	0.76	44.3	120.3
Overall	F	1.22	107.9	-	F	1.19	101.0	-	
Fisher Avenue at Deer Park Road/Dynes Road <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
	Overall	B	0.64	15.3	-	A	0.57	15.1	-

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 and westbound through movements are anticipated to exhibit high delays and 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 2034 Future Total Operations

Figure 18 illustrates the 2034 total volumes and Table 22 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 I.

Figure 18: 2034 Future Total Volumes

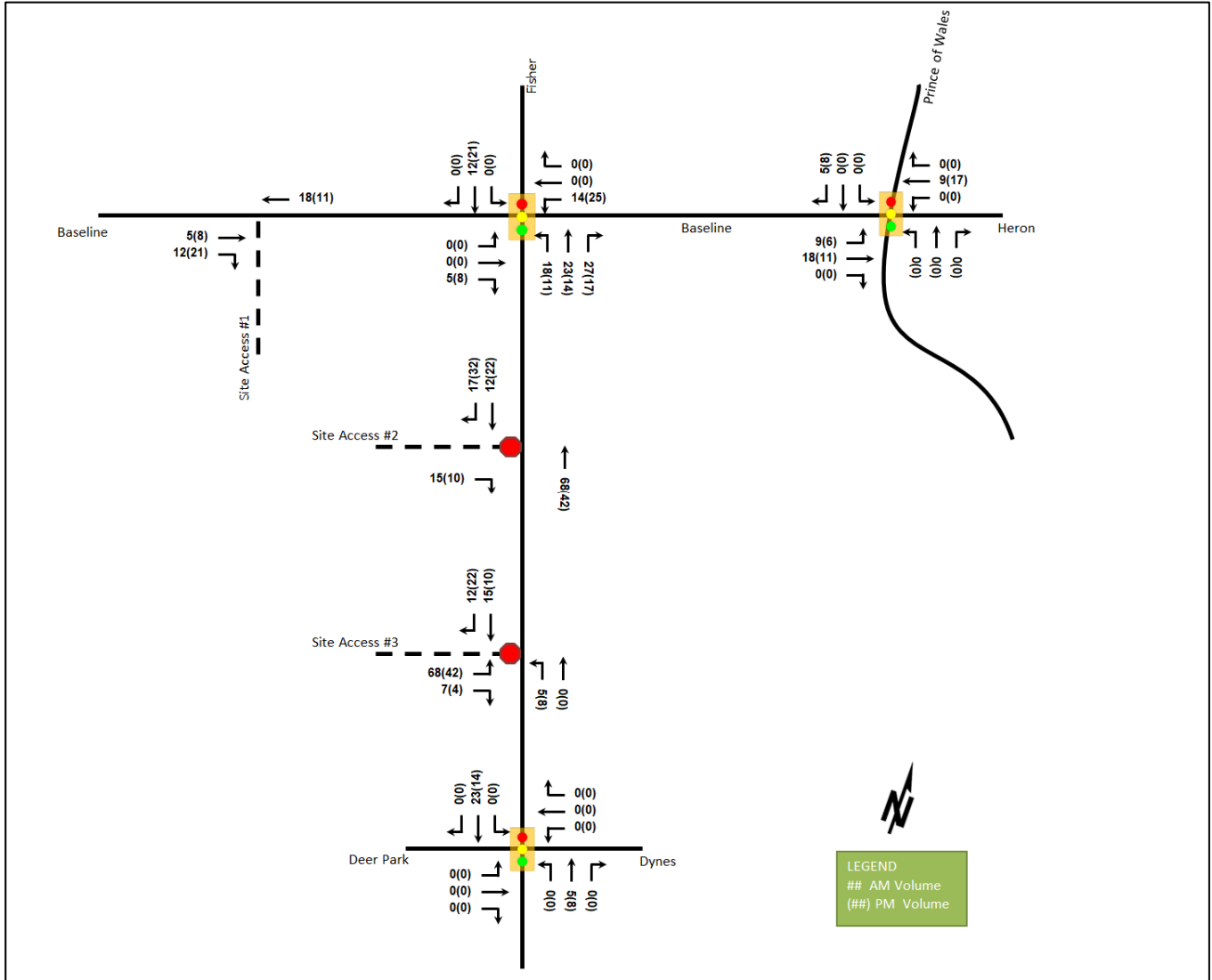


Table 22: 2034 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Fisher Avenue at Baseline Road Signalized	EBL	E	0.98	133.6	#71.3	D	0.84	114.6	#50.5
	EBT	F	1.05	80.0	#239.6	F	1.12	102.9	#248.3
	EBR	A	0.38	34.1	50.0	B	0.67	44.8	89.1
	WBL	B	0.62	72.7	m12.9	F	1.19	156.0	m#52.7
	WBT	F	1.05	108.2	m#168.6	E	1.00	62.9	m123.0
	WBR	A	0.31	67.4	m41.2	A	0.33	42.2	m33.4
	NBL	F	1.01	116.0	#114.5	F	1.14	165.6	#97.8
	NBT/R	B	0.66	44.2	96.1	A	0.60	44.6	77.9
	SBL	C	0.73	78.9	#55.0	F	1.02	136.1	#84.7
	SBT/R	A	0.60	44.9	76.3	E	0.98	73.3	#152.3
Overall	E	0.98	79.4	-	-	F	1.08	81.6	-
Prince of Wales Drive at Baseline Road/Heron Road Signalized	EBL	F	1.24	161.3	m#71.8	F	1.21	140.7	m#32.2
	EBT/R	D	0.85	73.3	m99.5	D	0.89	63.4	m69.1
	WBL	E	0.95	101.6	#107.1	E	0.98	100.0	#135.5
	WBT	F	1.03	80.2	#188.5	F	1.14	114.7	#231.3
	WBR	F	1.24	166.3	#241.3	E	0.99	85.2	#181.3
	NBL	A	0.53	70.1	32.9	A	0.53	70.1	36.2
	NBT/R	F	1.19	131.6	#252.8	F	1.21	139.6	#294.7
	SBL	F	1.26	204.0	#62.3	D	0.85	110.7	#31.1
	SBT/R	A	0.45	37.4	72.0	C	0.76	44.6	121.4
Overall	F	1.22	108.9	-	-	F	1.19	102.2	-
Fisher Avenue at Deer Park Road/Dynes Road Signalized	EB	A	0.40	25.9	29.4	A	0.17	23.6	13.1
	WB	B	0.64	27.6	42.2	C	0.76	46.2	54.8
	NBL/T	B	0.67	16.8	118.3	A	0.52	11.4	94.8
	NBR	A	0.21	2.3	8.2	A	0.03	1.3	2.1
	SB	A	0.40	10.6	40.5	A	0.52	10.2	72.9
Overall	B	0.65	15.4	-	-	A	0.57	15.2	-

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

The study area intersections at the 2034 future total horizon will operate similarly to the 2034 background conditions except for the eastbound left-turn and northbound left-turn movements at Fisher Avenue and Baseline Road intersection during AM peak hour.

At Fisher Avenue and Baseline Road intersection during the AM peak hour, the eastbound through will be over theoretical capacity with an increase of v/c of 0.10 above the background conditions, the westbound through will be over theoretical capacity with an increase of v/c of 0.03 above the background conditions, and the northbound left-turn movement will be over theoretical capacity with an increase of v/c of 0.48 above the background conditions. An increase of cycle length from 130 seconds to 140 seconds during the AM peak hour would reduce the v/c of all movements at the intersection to 1.00 or below.

7.3 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 limited to the transit mode share target for site traffic aside from the employment of the existing intersection geometry. 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 23 summarizes the total trip generation without Baseline Rapid Transit.

Table 23: 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%	53	118	171	41%	103	74	177
	Auto Passenger	6%	8	17	25	11%	27	20	47
	Transit	42%	62	139	201	33%	88	64	152
	Cycling	2%	3	7	10	2%	5	4	9
	Walking	8%	13	28	41	13%	38	28	66
	Total	100%	139	309	448	100%	261	190	451
Retail (<40k sq. ft.)	Auto Driver	71%	14	9	23	61%	22	15	37
	Auto Passenger	19%	10	6	16	16%	20	18	38
	Transit	1%	1	0	1	8%	10	9	19
	Cycling	0%	0	0	0	1%	17	1	2
	Walking	9%	5	3	8	14%	17	15	32
	Pass-by	40%	-22	-15	-37	40%	-52	-52	-104
	Internal Capture	varies	-6	-3	-9	varies	-8	-20	-28
	Total	100%	30	18	48	100%	70	58	128
Total	Auto Driver	-	67	127	194	-	125	89	214
	Auto Passenger	-	18	23	41	-	47	38	85
	Transit	-	63	139	202	-	98	73	171
	Cycling	-	3	7	10	-	6	5	11
	Walking	-	18	31	49	-	55	43	98
	Total	-	169	327	496	-	331	248	579

As shown above, a total of 194 AM and 214 PM new peak hour two-way vehicle trips are projected as a result of the proposed development. Table 24 summarizes the auto trip generation comparison between the scenarios without Baseline Rapid Transit and with Baseline Rapid Transit.

Table 24: 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	46	90	136	83	56	139
Without BRT	67	127	194	125	89	214
Difference	+21	+37	+58	+42	+33	+75

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 25 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 J.

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

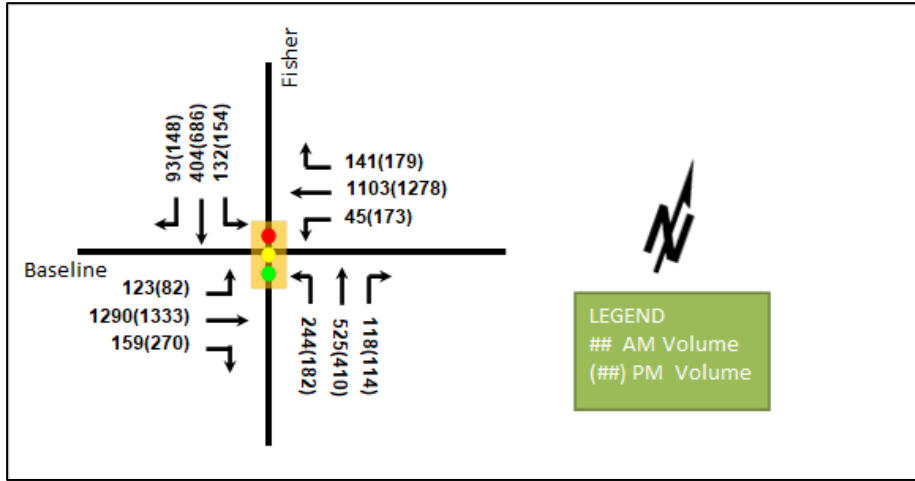


Table 25: 2034 Future Total Intersection Operations– Fisher Avenue at Baseline Road Without Baseline Rapid Transit

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Fisher Avenue at Baseline Road Signalized	EBL	B	0.66	71.1	49.2	A	0.57	71.4	36.4
	EBT	E	0.95	52.0	#228.7	F	1.10	97.5	#246.2
	EBR	A	0.26	3.6	10.0	A	0.50	17.3	48.9
	WBL	A	0.54	79.6	m7.5	E	0.94	108.2	#87.9
	WBT	E	1.00	39.3	m104.9	E	0.98	59.6	#228.8
	WBR	A	0.22	9.1	m11.7	A	0.28	7.4	20.2
	NBL	D	0.85	77.5	#97.3	D	0.82	83.1	#79.4
	NBT	B	0.66	48.5	83.5	A	0.60	51.8	69.6
	NBR	A	0.24	1.8	2.0	A	0.30	7.7	12.6
	SBL	C	0.71	76.5	53.7	C	0.75	77.2	60.8
	SBT	B	0.68	56.0	68.9	F	1.07	104.1	#145.3
	SBR	A	0.22	1.2	0.0	A	0.43	14.8	23.9
	Overall	D	0.89	46.1	-	F	1.03	71.8	-

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. The EA road improvements will reduce the intersection capacity through the addition of the BRT lanes and the geometric requirements for this facility will be a trade off on auto modes. Similarly, protected pedestrian and cycling movements that have been incorporated into the design will also reduce intersection operations. While the site will continue to be served by higher order roadways with auto lane capacity, the higher order transit on Baseline Road will serve a greater area than this site alone. Existing commuters, area residents and the site will be able to increase the adoption of transit and contribute to the success of this investment. As noted above, the sensitivity analysis is provided through the older paradigm and will continue to operate with a higher auto level of service. The City will have to acknowledge that the post BRT implementation will be a forceful shift of modes and beyond the developments responsibility to mitigate. Ultimately, the sensitivity illustrates that the area will continue to operate in a consistent manner, with Sections 7.1 and 7.2 illustrating the operational issues that may arise through slow adoption of transit.

7.4 Demand Rationalization Conclusions

7.4.1 Network Rationalization

At the intersections of Fisher Avenue at Baseline Road and Prince of Wales Drive at Baseline Road/Heron Road, the future BRT geometry and background growth are anticipated to be the primary driver of impacts to the forecasted operations.

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 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 5% of the volumes, for the conditions inclusive of all known future area developments, would be required at the intersection of Fisher Avenue and Baseline Road in the PM peak hour. The intersection of Prince of Wales Drive at Baseline Road/Heron Road is forecast to operate better in the future conditions with the BRT implementation than in the existing conditions, partly due to the removal of detour volumes, and partly through the addition of a southbound left-turn lane as part of the modifications, though the elimination of the westbound left-turn lane, an eastbound through lane, and a northbound right-turn lane is planned.

7.4.2 Development Rationalization

The proposed mode shares for the development are appropriate to target, supported by the planned corridor improvements including BRT. These targets should be supported through TDM measures, and the sensitivity analysis indicated that the timing of the improvements was not associated with increased impacts to network operations. Therefore, no further rationalization for site traffic is required.

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 K. 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
- Provision of a bicycle repair station
- 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 26 summarizes the transit trip generation.

Table 26: Trip Generation by Transit Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	Varies	83	176	259	137	103	240

The proposed development is anticipated to generate 259 AM and 240 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 27 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 27: Forecasted Site-Generated Transit Ridership

Direction	AM Peak Hour		PM Peak Hour		Service Type	Equivalent Service Increase
	In	Out	In	Out		
North	25	53	41	31	Bus, BRT (future)	A standard bus load
South	21	44	34	26		A standard bus load
East	16	35	28	20		Two-thirds standard bus load
West	21	44	34	26		A 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.

No reduction in transit MMLOS is noted on any approach at the intersection of Fisher Avenue at Baseline Road between this sensitivity analysis and the existing conditions.

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 Network Intersection Operations

The operations are noted in Section 7.2 and no further rationalization is required.

10.2.2 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.

10.2.3 Recommended Design Elements

No study area intersection design elements are proposed as part of this study, either for the buildout scenario with BRT or for the sensitivity analysis scenario.

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 1,089 dwelling units and 30,650 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 a right-in-only access on Baseline Road, the conversion of an existing full-movements access on Fisher Avenue to right-in/right-out via the extension of the median, and a new full-movement access via a future extension of the auxiliary left-turn lane on Fisher Avenue
- A total of 999 residential, 105 visitor, 45 commercial vehicle parking spaces, and 1089 residential and 32 commercial bicycle parking spaces are proposed
- 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 a 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 and Dear Park Road east of Millbrook Crescent
- 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 McCooley 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
- The City has developed a protected intersection design as part of the Baseline Road Rapid Transit Corridor project to improve active mode safety
- No further examination of collisions at the Fisher Avenue at Baseline Road intersection is required as part of this study
- 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 509 two-way person trips during the AM peak hour and 583 two-way person trips during the PM peak hour
- The proposed development is forecasted produce 136 two-way vehicle trips during the AM peak hour and 139 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 34,950 sq. ft of commercial building and is estimated to produce 25 AM two-way auto trips in the AM peak hour and 60 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, 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 5% is required at the intersection of Fisher Avenue at Baseline Road via a shift in auto traffic to transit, and the intersection of Prince of Wales Drive at Baseline Road/Heron Road is anticipated to operate better than the existing conditions in the future conditions
- Adjusted mode shares have been used for the site's trip generation accounting for the availability of higher order transit at build-out
- The selected mode shares are considered appropriate and should be supported through TDM measures, and the timing of improvements is not associated with increased network impacts

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
 - Provision of a bicycle repair station

- 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 259 two-way trips during the AM peak and 240 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

- 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:



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Transportation Engineering-Intern

Reviewed By:



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

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


City Of Ottawa
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Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

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

Name: Andrew Harte
(Please Print)

Professional Title: Professional Engineer



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

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



Appendix B

Turning Movement Counts



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ FISHER AVE

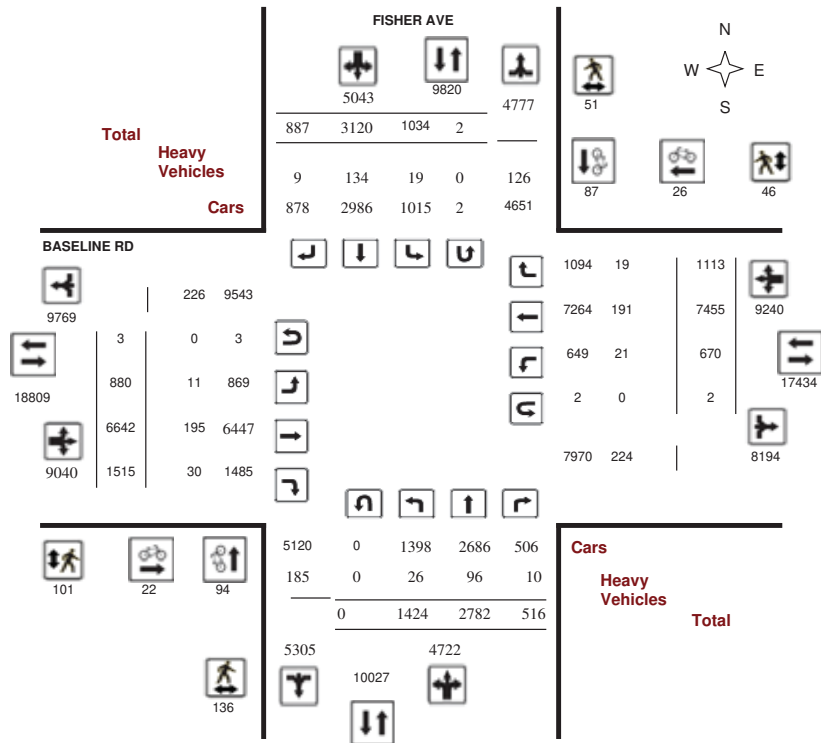
Survey Date: Wednesday, August 03, 2016

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

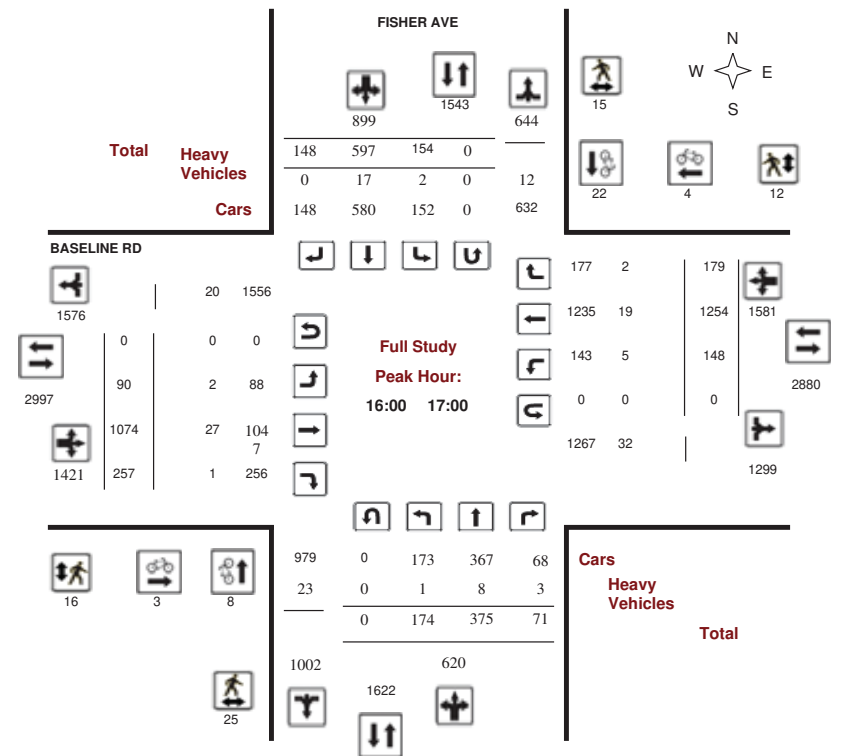
Survey Date: Wednesday, August 03, 2016

WO No: 36121

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram





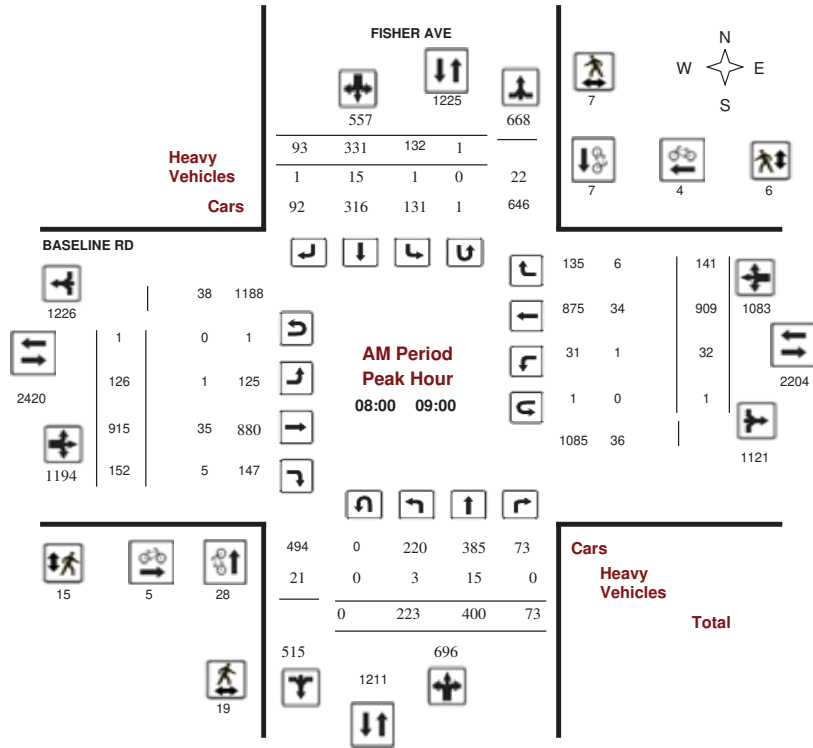
Transportation Services - Traffic Services

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



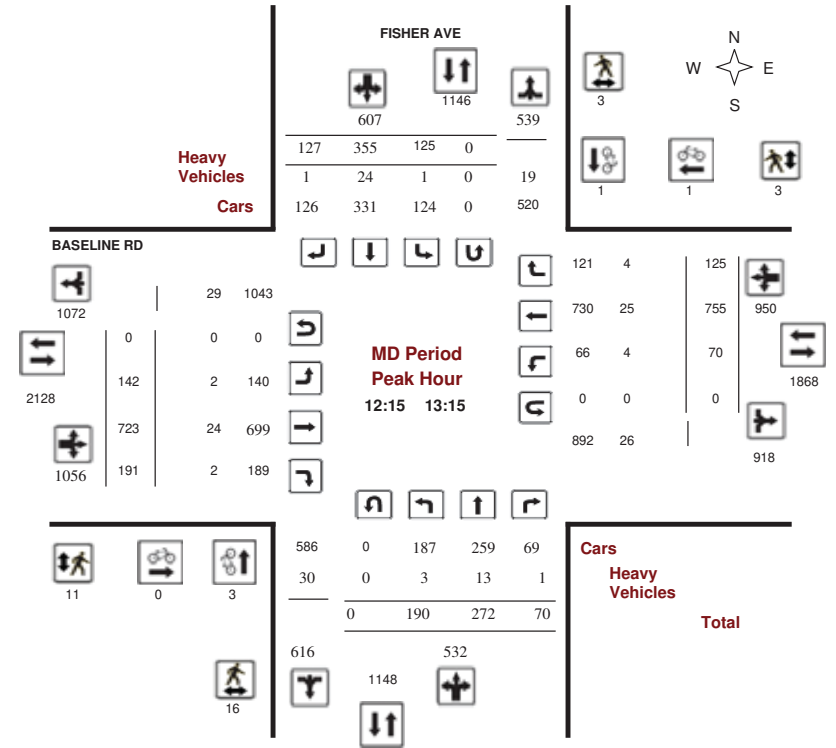
Transportation Services - Traffic Services

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





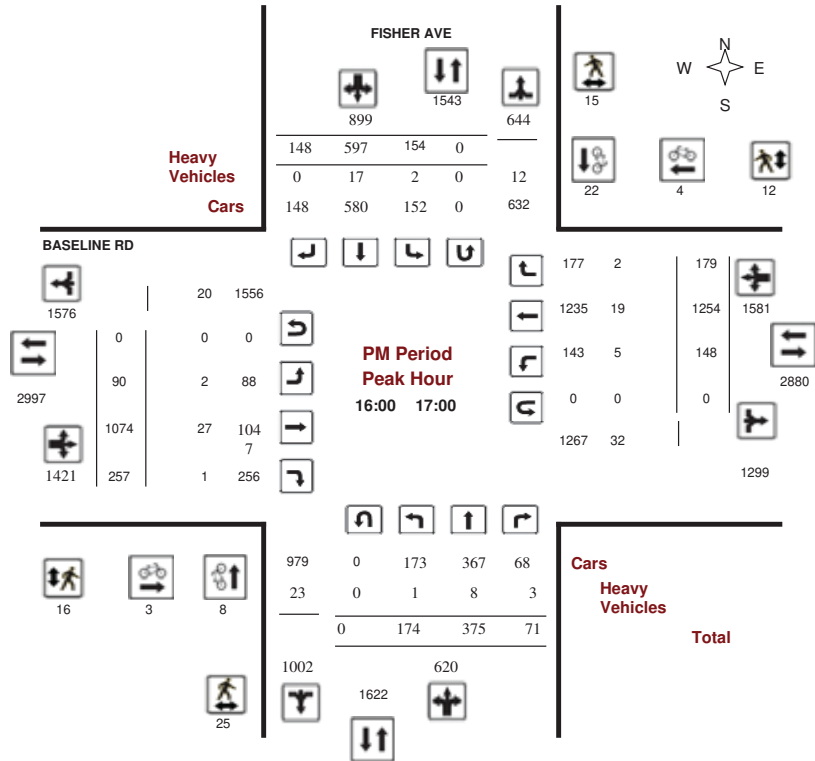
Transportation Services - Traffic Services

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



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

ADT Factor .90

Period	FISHER AVE				BASELINE RD				WB TOT	STR TOT	Grand Total								
	Northbound		Southbound		Eastbound		Westbound												
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	WB TOT	STR TOT	Grand Total			
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
Sub Total	1424	2782	516	4722	1034	3120	887	5041	9763	880	6642	1515	9037	670	7455	1113	9238	18275	28038
U Turns	0			0	2			2	2	3			3	2			2	5	7
Total	1424	2782	516	4722	1036	3120	887	5043	9765	883	6642	1515	9040	672	7455	1113	9240	18280	28045
EQ 12Hr	1979	3867	717	6563	1440	4337	1233	7010	13573	1227	9232	2106	12565	934	10362	1547	12843	25408	38981
AVG 12Hr	1781	3480	645	5906	1296	3903	1110	6309	12215	1104	8309	1895	11308	841	9326	1392	11559	22867	35082
AVG 24Hr	2333	4559	845	7737	1698	5113	1454	8265	16002	1446	10885	2482	14813	1102	12217	1824	15143	29956	45958

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 ADT factor. **.90**

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 @ 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	STR TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	STR 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

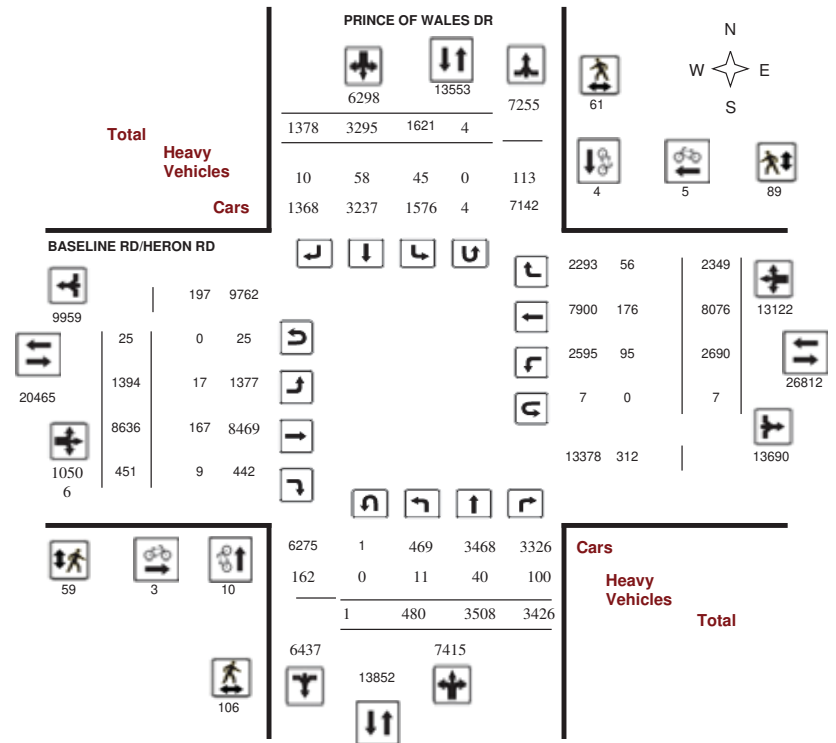
Survey Date: Wednesday, March 04, 2020

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

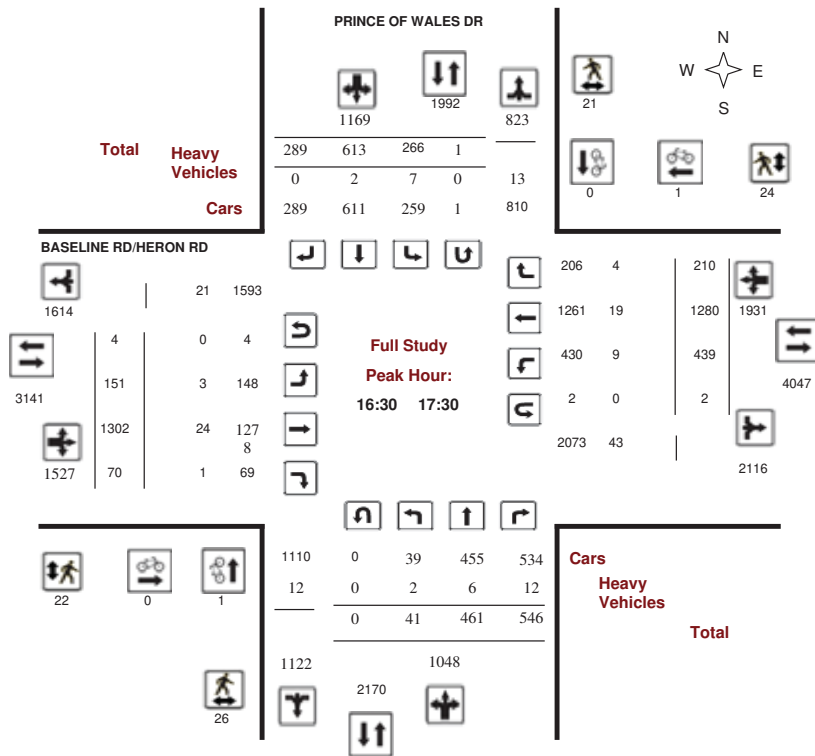
Survey Date: Wednesday, March 04, 2020

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

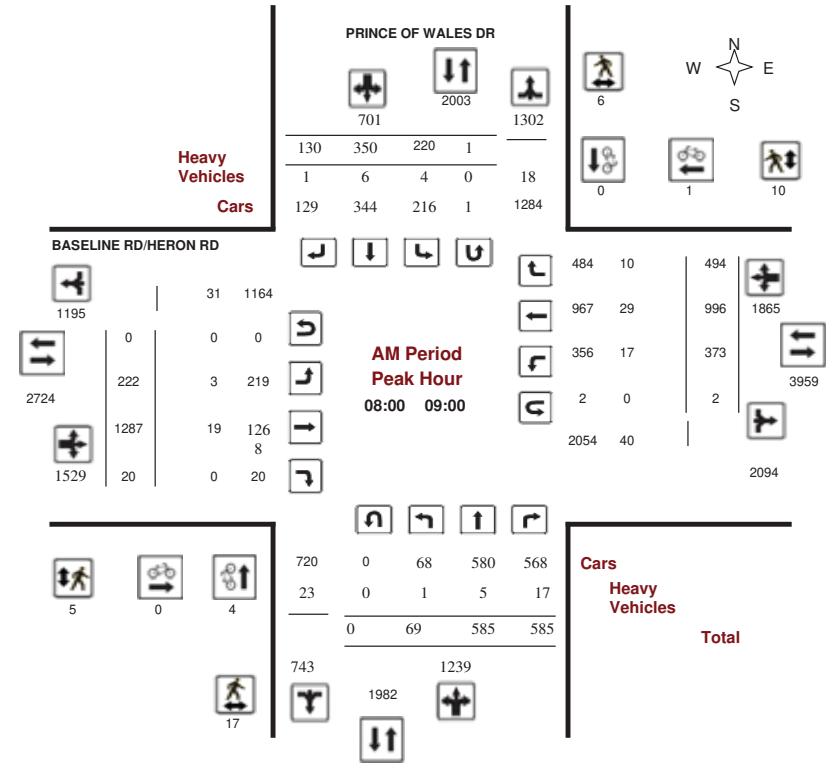
BASELINE RD/HERON RD @ PRINCE OF WALES DR

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 - 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
1.00

Period	PRINCE OF WALES DR								BASELINE RD/HERON 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	53	669	421	1143	179	315	73	567	1710	205	1201	40	1446	274	809	433	1516	2962	4672
08:00-09:00	69	585	585	1239	220	350	130	700	1939	222	1287	20	1529	373	996	494	1863	3392	5331
09:00-10:00	68	436	359	863	155	282	103	540	1403	186	977	55	1218	264	826	269	1359	2577	3980
11:30-12:30	70	272	290	632	163	302	153	618	1250	130	695	44	869	272	848	198	1318	2187	3437
12:30-13:30	74	306	322	702	140	286	149	575	1277	165	805	82	1052	281	788	201	1270	2322	3599
15:00-16:00	57	387	414	858	234	572	218	1024	1882	161	1101	73	1335	368	1213	325	1906	3241	5123
16:00-17:00	41	430	528	999	287	607	292	1186	2185	160	1265	70	1495	426	1278	208	1912	3407	5592
17:00-18:00	48	423	507	978	243	581	260	1084	2062	165	1305	67	1537	432	1318	221	1971	3508	5570
Sub Total	480	3508	3426	7414	1621	3295	1378	6234	13708	1394	8636	451	10481	2690	8076	2349	13115	23596	37304
U Turns				1				4	5				25				7	32	37
Total	480	3508	3426	7415	1621	3295	1378	6238	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

Time Period	PRINCE OF WALES DR										BASELINE RD/HERON RD										W TOT	STR TOT	Grand Total
	Northbound					Southbound					Eastbound					Westbound							
	LT	ST	RT	N TOT	STR TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	STR TOT	LT	ST	RT	W TOT	STR TOT			
07:00-07:15	13	142	88	243	37	62	12	111	6	47	265	5	317	60	184	88	332	6	1003				
07:15-07:30	7	169	91	267	41	74	14	129	7	67	333	12	412	61	198	111	370	7	1178				
07:30-07:45	18	171	109	298	54	80	27	161	12	44	339	7	391	75	209	110	394	12	1244				
07:45-08:00	15	187	133	335	47	99	20	166	12	47	264	16	327	78	218	124	420	12	1248				
08:00-08:15	16	140	134	290	53	73	34	160	5	58	297	4	359	112	253	144	511	5	1320				
08:15-08:30	16	143	124	283	59	81	25	165	11	55	332	5	392	79	228	137	444	11	1284				
08:30-08:45	22	151	152	325	56	78	46	180	10	45	323	3	371	106	257	119	482	10	1358				
08:45-09:00	15	151	175	341	52	118	25	196	8	64	335	8	407	76	258	94	428	8	1372				
09:00-09:15	19	126	116	261	39	77	23	139	9	65	340	10	416	76	236	80	392	9	1208				
09:15-09:30	13	109	98	220	29	68	22	119	13	40	231	13	286	74	216	77	367	13	992				
09:30-09:45	15	96	79	190	42	71	25	138	13	51	223	12	286	52	160	51	263	13	877				
09:45-10:00	21	105	66	192	45	66	33	144	7	30	183	20	233	62	214	61	337	7	906				
11:30-11:45	16	62	70	148	35	72	31	138	10	34	144	13	194	62	223	49	335	10	815				
11:45-12:00	15	71	58	144	39	76	45	160	7	28	210	12	251	80	220	48	348	7	903				
12:00-12:15	22	70	78	170	37	71	51	160	6	25	186	10	222	79	209	44	332	6	884				
12:15-12:30	17	69	84	170	52	83	26	161	8	43	155	9	209	51	196	57	304	8	844				
12:30-12:45	13	83	87	183	40	77	44	161	6	45	210	25	282	53	209	55	317	6	943				
12:45-13:00	20	56	76	152	34	74	33	142	8	32	223	19	275	68	190	56	314	8	883				
13:00-13:15	18	75	76	169	34	54	35	123	8	52	192	25	269	83	194	40	318	8	879				
13:15-13:30	23	92	83	199	32	81	37	150	7	36	180	13	231	77	195	50	322	7	902				
15:00-15:15	18	70	90	178	46	115	64	225	4	34	234	22	290	74	356	81	511	4	1204				
15:15-15:30	17	106	105	228	65	141	59	265	10	49	243	19	311	94	298	84	476	10	1280				
15:30-15:45	14	109	99	222	60	172	47	279	13	32	274	19	326	82	255	86	423	13	1250				
15:45-16:00	8	102	120	230	63	144	48	255	6	46	350	13	410	118	304	74	496	6	1391				
16:00-16:15	8	101	133	242	76	163	47	286	13	58	278	20	356	118	307	55	481	13	1365				
16:15-16:30	8	89	123	220	75	134	88	297	6	29	352	17	398	100	342	45	487	6	1402				
16:30-16:45	17	122	146	285	55	147	90	292	11	38	334	19	392	108	344	64	517	11	1486				
16:45-17:00	8	118	126	252	81	163	67	311	11	35	301	14	352	100	285	44	430	11	1345				
17:00-17:15	11	104	147	262	61	136	71	268	4	41	344	16	401	111	320	40	471	4	1402				
17:15-17:30	5	117	127	249	69	167	61	298	3	37	323	21	382	120	331	62	513	3	1442				
17:30-17:45	13	110	124	247	62	156	59	277	9	43	333	15	393	86	313	67	466	9	1383				
17:45-18:00	19	92	109	220	51	122	69	242	1	44	305	15	365	115	354	52	521	1	1348				
Total:	480	3508	3426	7415	1621	3295	1378	6298	264	1394	8636	451	10506	2690	8076	2349	13122	264	37,341				

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.

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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

Time Period	PRINCE OF WALES DR										BASELINE RD/HERON RD										Grand Total
	Northbound					Southbound					Eastbound					Westbound					
	LT	ST	RT	N TOT	S TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT		
07:00	07:15	0	1	3	4	1	1	0	2	6	0	0	1	1	2	3	2	7	8	14	
07:15	07:30	0	2	4	6	0	0	1	1	7	0	6	0	6	4	3	3	10	16	23	
07:30	07:45	0	2	2	4	2	5	1	8	12	2	1	0	3	5	7	3	15	18	30	
07:45	08:00	0	2	6	8	2	2	0	4	12	1	5	0	6	6	7	3	16	22	34	
08:00	08:15	0	0	4	4	1	0	0	1	5	0	3	0	3	4	13	2	19	22	27	
08:15	08:30	0	2	4	6	1	3	1	5	11	0	4	0	4	7	6	4	17	21	32	
08:30	08:45	1	2	5	8	1	1	0	2	10	3	5	0	8	2	5	2	9	17	27	
08:45	09:00	0	1	4	5	1	2	0	3	8	0	7	0	7	4	5	2	11	18	26	
09:00	09:15	1	2	5	8	0	1	0	1	9	1	7	0	8	2	10	2	14	22	31	
09:15	09:30	1	3	5	9	1	2	1	4	13	1	5	0	6	4	4	1	9	15	28	
09:30	09:45	1	1	3	5	0	7	1	8	13	1	5	1	7	3	3	2	8	15	28	
09:45	10:00	0	0	1	1	2	4	0	6	7	0	9	1	10	0	5	0	5	15	22	
11:30	11:45	0	0	5	5	2	3	0	5	10	1	4	0	5	3	2	2	7	12	22	
11:45	12:00	0	2	3	5	0	1	1	2	7	0	4	0	4	3	7	4	14	18	25	
12:00	12:15	0	1	3	4	2	0	0	2	6	1	3	0	4	6	6	2	14	18	24	
12:15	12:30	2	0	2	4	2	1	1	4	8	1	3	0	4	1	2	4	7	11	19	
12:30	12:45	0	1	1	2	0	2	2	4	6	0	4	0	4	3	3	2	8	12	18	
12:45	13:00	0	1	2	3	2	2	1	5	8	0	5	2	7	1	3	1	5	12	20	
13:00	13:15	0	1	4	5	0	3	0	3	8	1	5	1	7	3	8	1	12	19	27	
13:15	13:30	0	2	2	4	2	1	0	3	7	0	4	1	5	2	4	1	7	12	19	
15:00	15:15	2	0	2	4	0	0	0	0	4	0	6	0	6	2	3	0	5	11	15	
15:15	15:30	0	1	2	3	5	2	0	7	10	0	6	0	6	3	6	1	10	16	26	
15:30	15:45	0	1	5	6	2	5	0	7	13	1	6	1	8	1	15	2	18	26	39	
15:45	16:00	0	0	2	2	2	2	0	4	6	0	9	0	9	5	7	3	15	24	30	
16:00	16:15	0	4	5	9	1	3	0	4	13	0	11	0	11	1	6	0	7	18	31	
16:15	16:30	0	2	1	3	3	0	0	3	6	0	7	0	7	2	5	0	7	14	20	
16:30	16:45	1	4	6	11	0	0	0	0	11	1	11	1	13	2	4	3	9	22	33	
16:45	17:00	0	2	4	6	4	1	0	5	11	1	5	0	6	1	5	1	7	13	24	
17:00	17:15	0	0	2	2	2	0	0	2	4	1	6	0	7	4	5	0	9	16	20	
17:15	17:30	1	0	0	1	1	1	0	2	3	0	2	0	2	2	5	0	7	9	12	
17:30	17:45	1	0	2	3	3	3	0	6	9	0	5	0	5	4	4	2	10	15	24	
17:45	18:00	0	0	1	1	0	0	0	0	1	0	4	0	4	3	5	1	9	13	14	
Total:	None	11	40	100	151	45	58	10	113	264	17	167	9	193	95	176	56	327	520	784	



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

Time Period	PRINCE OF WALES DR				BASELINE RD/HERON RD				Total
	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn 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	0	0	0
07:15	07:30	0	0	0	0	0	0	0	0
07:30	07:45	0	0	1	0	0	0	1	1
07:45	08:00	0	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	2	0	2
08:15	08:30	0	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0	0
08:45	09:00	0	1	0	0	0	0	1	1
09:00	09:15	0	0	1	0	2	0	0	2
09:15	09:30	0	0	0	0	0	0	0	0
09:30	09:45	0	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	0	0	0	0
11:30	11:45	0	0	3	1	0	0	4	4
11:45	12:00	0	0	1	0	0	0	1	1
12:00	12:15	0	1	1	1	0	0	2	2
12:15	12:30	0	0	2	0	0	0	2	2
12:30	12:45	0	0	0	2	0	0	2	2
12:45	13:00	0	1	2	1	0	0	3	3
13:00	13:15	0	1	4	5	0	1	10	11
13:15	13:30	0	2	2	4	2	1	7	9
13:30	13:45	0	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0	0
14:15	14:30	0	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0
17:15	17:30	0	1	1	1	0	0	2	2
17:30	17:45	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0
Total	None	1	4	25	7	0	0	37	37



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FISHER AVE @ DEER PARK RD/DYNES RD

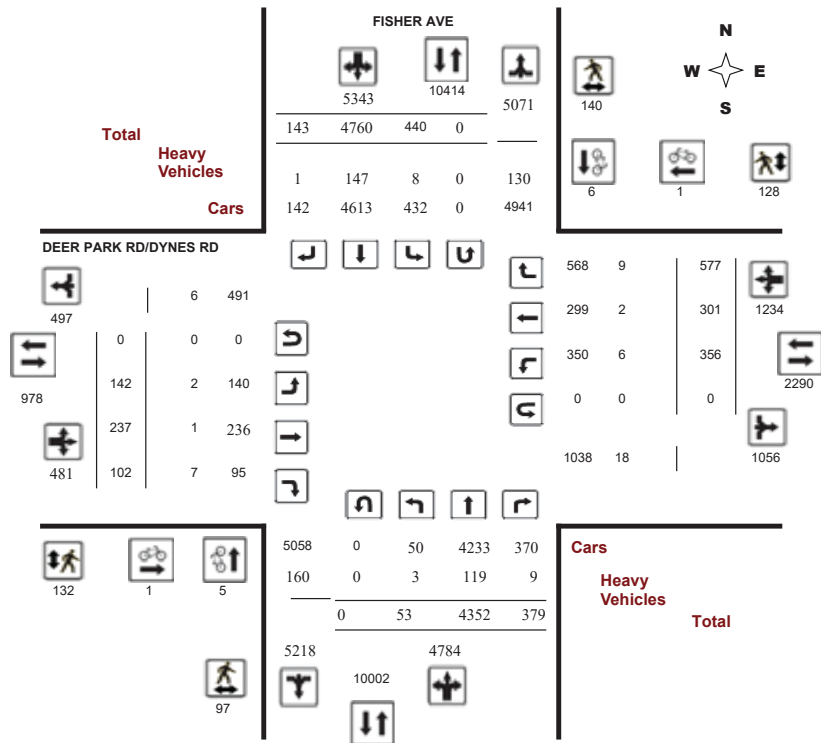
Survey Date: Wednesday, March 09, 2016

WO No: 35788

Start Time: 07:00

Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FISHER AVE @ DEER PARK RD/DYNES RD

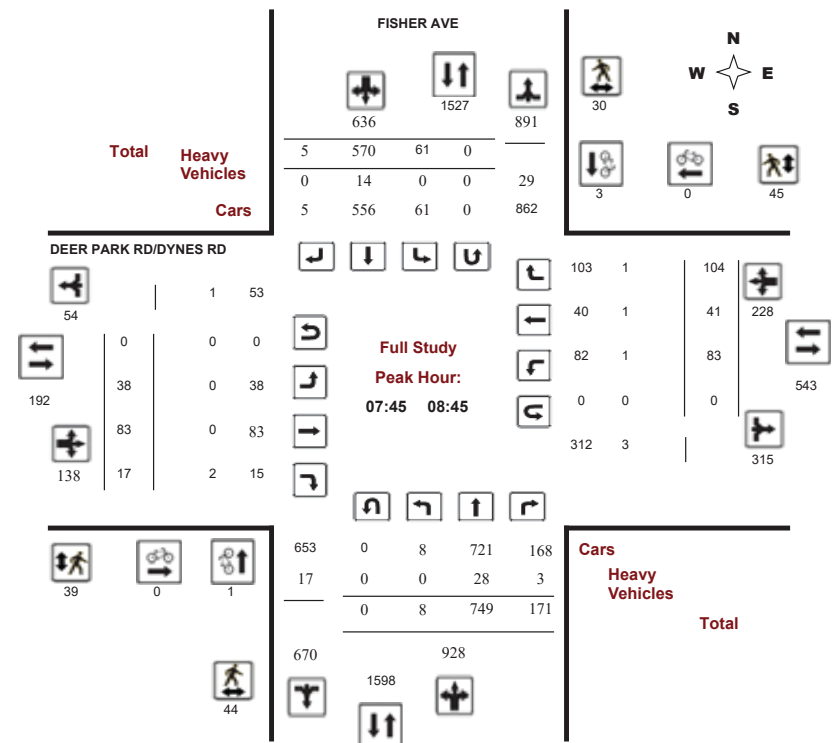
Survey Date: Wednesday, March 09, 2016

WO No: 35788

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

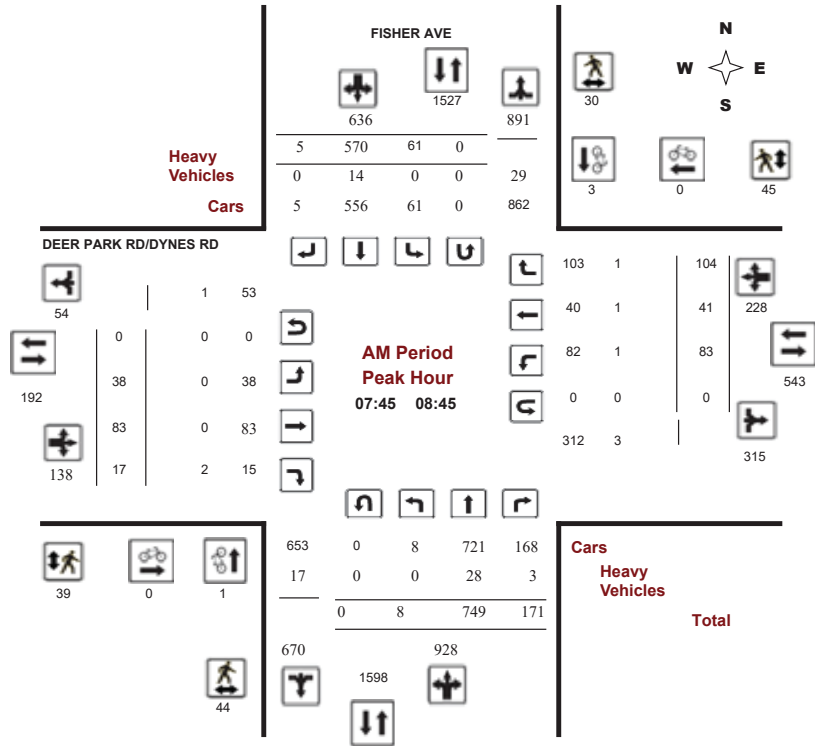
FISHER AVE @ DEER PARK RD/DYNES RD

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

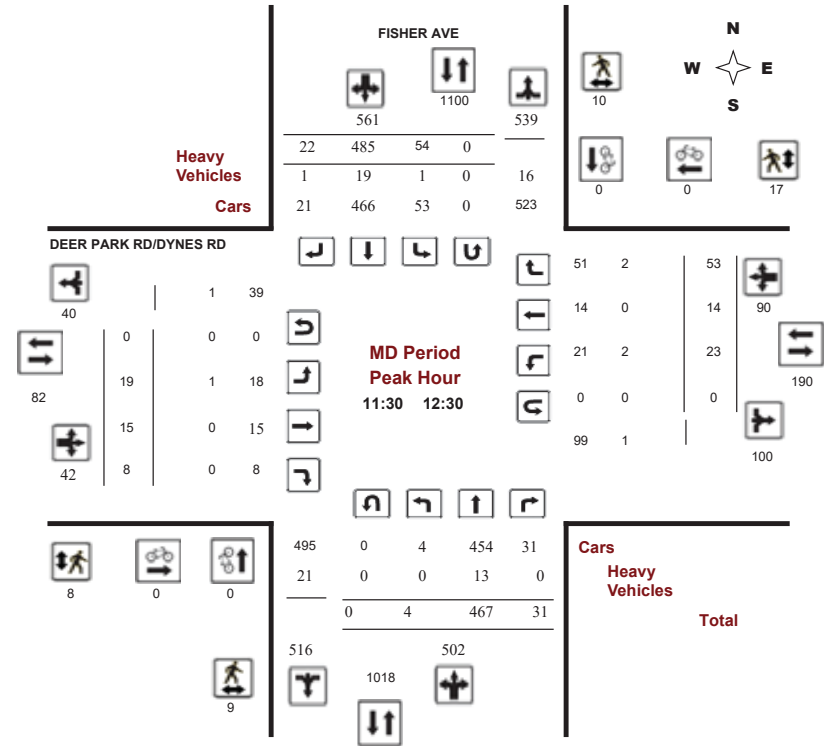
FISHER AVE @ DEER PARK RD/DYNES RD

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

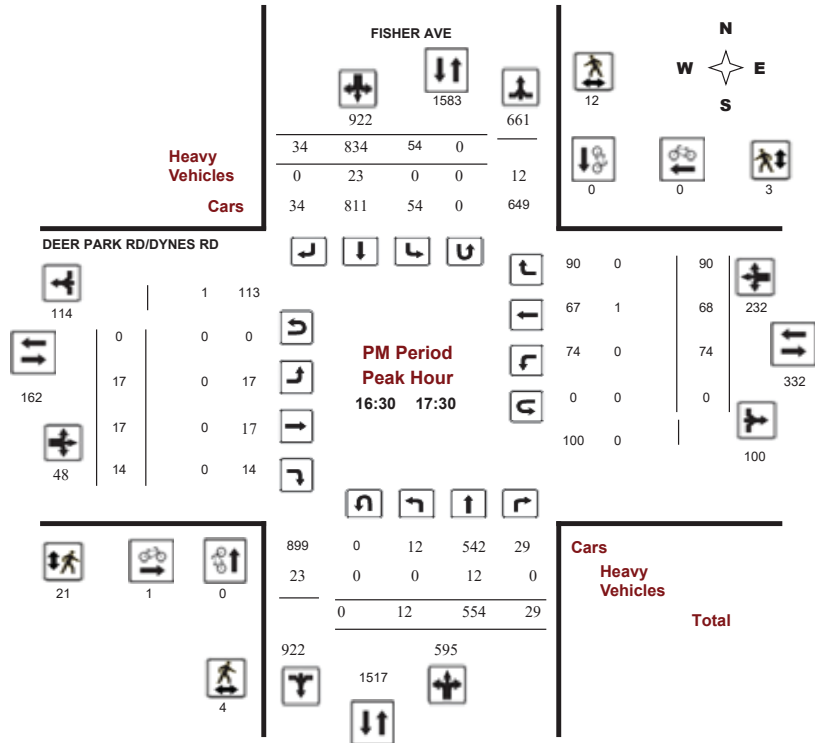
FISHER AVE @ DEER PARK RD/DYNES RD

Survey Date: Wednesday, March 09, 2016

Start Time: 07:00

WO No: 35788

Device: Miovision



Comments



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	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT			
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
Sub Total	53	4352	379	4784	440	4760	143	5343	10127	142	237	102	481	356	301	577	1234	1715	11842
U Turns	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	53	4352	379	4784	440	4760	143	5343	10127	142	237	102	481	356	301	577	1234	1715	11842
EQ 12Hr	74	6049	527	6650	612	6616	199	7427	14077	197	329	142	668	495	418	802	1715	2383	16460
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													1.39						
AVG 12Hr	74	6049	527	6650	612	6616	199	7427	14077	197	329	142	668	495	418	802	1715	2383	16460
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													1.00						
AVG 24Hr	97	7924	690	8711	802	8667	261	9730	18441	258	431	186	875	648	548	1051	2247	3122	21563
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

FISHER AVE										DEER PARK RD/DYNES RD										
Northbound					Southbound					Eastbound					Westbound					Grand Total
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT		
07:00	07:15	120	9			104	2		246		3	2			3	10		22	268	
07:15	07:30	165	3			135	1		311		11	1			3	15		39	350	
07:30	07:45	171	17			125	3		333		15	5			3	28		68	401	
07:45	08:00	176	40			148	1		387		23	5			5	30		94	481	
08:00	08:15	173	44			140	2		376		21	2			10	26		86	462	
08:15	08:30	212	62			155	0		446		32	5			20	34		135	581	
08:30	08:45	188	25			127	2		355		7	5			6	14		51	406	
08:45	09:00	173	9			162	6		358		8	1			12	21		53	411	
09:00	09:15	125	12			117	5		272		12	7			13	19		57	329	
09:15	09:30	128	7			108	2		254		7	3			4	20		38	292	
09:30	09:45	117	10			128	3		270		2	6			2	12		30	300	
09:45	10:00	98	1			95	3		214		5	4			5	12		34	248	
11:30	11:45	104	2			111	9		243		5	2			3	15		36	279	
11:45	12:00	128	13			124	1		278		3	2			6	12		36	314	
12:00	12:15	110	8			118	4		257		5	2			3	14		35	292	
12:15	12:30	125	8			132	8		285		2	2			2	12		25	310	
12:30	12:45	105	8			120	3		251		2	1			2	11		22	273	
12:45	13:00	108	3			102	5		234		1	1			1	15		20	254	
13:00	13:15	107	6			101	4		223		4	4			7	6		25	248	
13:15	13:30	90	6			122	3		235		3	4			1	12		37	272	
15:00	15:15	142	9			144	5		319		4	1			12	16		45	364	
15:15	15:30	150	4			186	7		365		11	4			22	25		75	440	
15:30	15:45	143	5			172	3		349		11	3			13	12		53	402	
15:45	16:00	132	10			194	6		358		5	5			10	22		71	429	
16:00	16:15	140	6			186	7		346		7	3			16	15		60	406	
16:15	16:30	121	11			213	4		371		6	2			22	17		76	447	
16:30	16:45	136	7			231	8		398		2	1			16	19		58	456	
16:45	17:00	132	9			209	11		371		7	4			23	27		91	462	
17:00	17:15	139	7			183	7		359		5	5			16	19		64	423	
17:15	17:30	147	6			211	8		389		3	4			13	25		67	456	
17:30	17:45	125	6			188	6		350		1	6			17	25		70	420	
17:45	18:00	122	6			169	4		324		4	0			10	17		42	366	
Total:		0	4352	379	0	4760	143	0	10127	0	237	102	0	0	301	577	0	10127	11,842	

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

FISHER AVE			DEER PARK RD/DYNES RD			Grand Total	
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound		Street Total
07:00	07:15	0	0	0	0	0	0
07:15	07:30	0	0	0	0	0	0
07:30	07:45	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0
08:00	08:15	0	0	0	0	0	0
08:15	08:30	1	1	2	0	0	2
08:30	08:45	0	2	2	0	0	2
08:45	09:00	0	0	0	0	0	0
09:00	09:15	0	0	0	0	0	0
09:15	09:30	1	1	2	0	0	2
09:30	09:45	1	0	1	0	0	1
09:45	10:00	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0
15:15	15:30	0	1	1	0	0	1
15:30	15:45	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0
16:15	16:30	1	0	1	0	1	2
16:30	16:45	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0
17:00	17:15	0	0	0	1	0	1
17:15	17:30	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0
17:45	18:00	1	1	2	0	0	2
Total		5	6	11	1	1	13



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



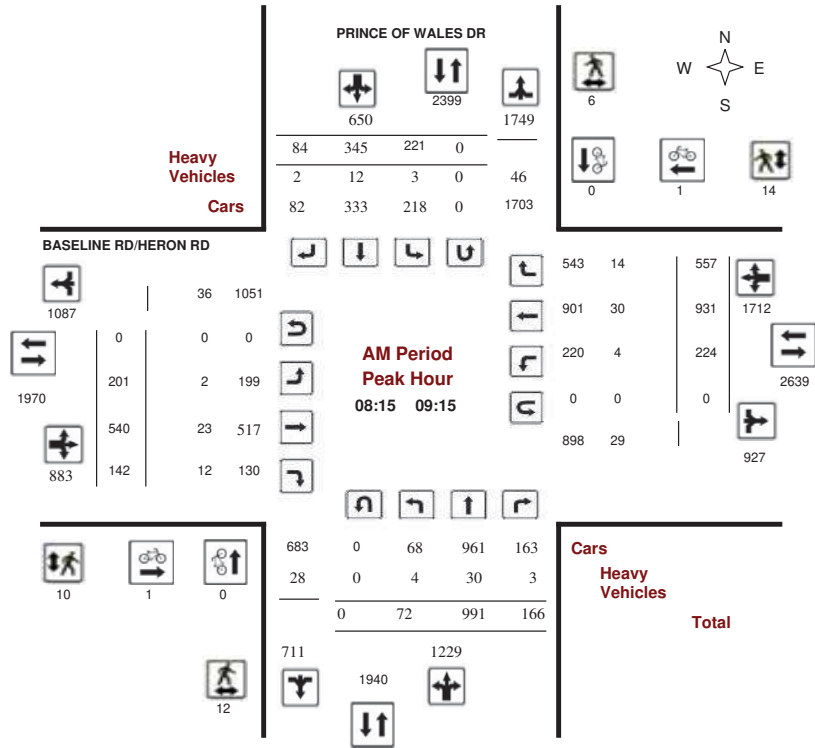
Transportation Services - Traffic Services

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



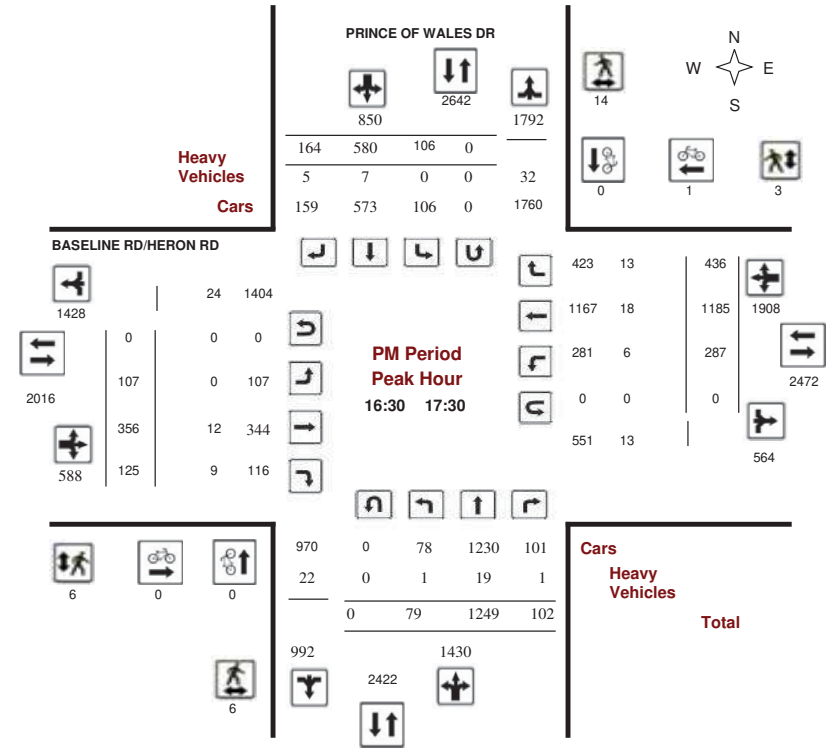
Transportation Services - Traffic Services

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	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	1635	3252	1416	1634	3252	1414	1650	3221	1418
Satd. Flow (RTOR)			180			232			181			231
Lane Group Flow (vph)	140	1444	169	36	1143	157	248	511	81	147	391	103
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)	15.7	60.2	60.2	6.8	46.4	46.4	22.7	28.1	28.1	15.2	20.7	20.7
Actuated g/C Ratio	0.12	0.46	0.46	0.05	0.36	0.36	0.17	0.22	0.22	0.12	0.16	0.16
v/c Ratio	0.70	0.96	0.23	0.42	0.99	0.24	0.86	0.73	0.18	0.76	0.76	0.25
Control Delay	73.0	50.4	3.8	82.5	34.5	9.9	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	0.0
Total Delay	73.0	50.4	3.8	82.5	34.5	9.9	78.6	53.6	0.9	79.3	62.4	1.4
LOS	E	D	A	F	C	A	E	D	A	E	E	A
Approach Delay		47.7			32.9			55.9			56.5	
Approach LOS		D			C			E			E	
Queue Length 50th (m)	34.8	~224.0	0.0	7.4	~170.1	25.5	61.1	64.1	0.0	36.5	51.0	0.0
Queue Length 95th (m)	55.3	#272.2	12.2	m5.3	m99.9	m12.9	#100.0	81.1	0.0	#62.8	66.7	0.0
Internal Link Dist (m)		145.0			161.5			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	1507	745	88	1159	654	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	0.56	0.96	0.23	0.41	0.99	0.24	0.78	0.65	0.17	0.67	0.66	0.23

Intersection Summary

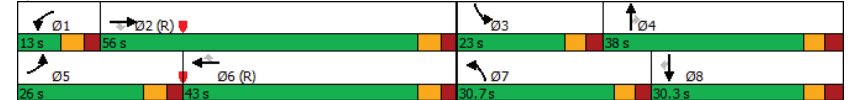
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 119 (92%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated

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

Existing
AM Peak Hour

Maximum v/c Ratio: 0.99	Intersection LOS: D
Intersection Signal Delay: 46.1	ICU Level of Service E
Intersection Capacity Utilization 89.7%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 1: Fisher Ave & Baseline Rd



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	106.7		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	106.7		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		120.0			248.1			64.1			66.5	
Approach LOS		F			F			E			E	
Queue Length 50th (m)	~78.6	~160.4		52.8	~226.9	24.0	19.2	83.3	~105.5	~68.4	56.6	
Queue Length 95th (m)	m#92.4	m#178.5		70.2	#268.6	#90.8	34.4	105.8	#177.9	#120.1	78.7	
Internal Link Dist (m)		188.2			220.4			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

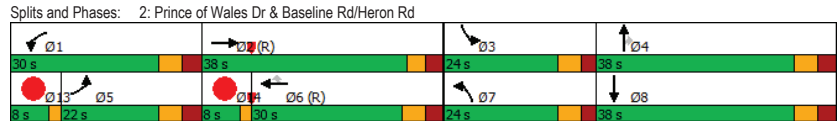
Lane Group	Ø13	Ø14
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Fit Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	13	14
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	1.0	1.0
Minimum 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 LOS: F
Intersection Signal Delay: 144.8	ICU Level of Service F
Intersection Capacity Utilization 96.1%	
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	
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	47.1	47.1	
Actuated g/C Ratio		0.24			0.24		0.59	0.59	0.59	0.59	0.59	
v/c Ratio		0.44			0.69		0.70	0.23	0.44	0.44	0.44	
Control Delay		26.4			30.3		18.7	2.5	11.6	11.6	11.6	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		26.4			30.3		18.7	2.5	11.6	11.6	11.6	
LOS		C			C		B	A	B	B	B	
Approach Delay		26.4			30.3		15.2		11.6	11.6	11.6	
Approach LOS		C			C		B		B	B	B	
Queue Length 50th (m)		17.0			25.0		79.2	0.0	30.4	30.4	30.4	
Queue Length 95th (m)		31.2			46.5		#148.5	9.1	46.4	46.4	46.4	
Internal Link Dist (m)		152.1			156.9		172.3		30.0	30.0	30.0	
Turn Bay Length (m)												
Base Capacity (vph)		456			466		997	836	1483	1483	1483	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.34			0.55		0.70	0.23	0.44	0.44	0.44	

Intersection Summary												
Cycle Length: 80												
Actuated Cycle Length: 80												
Offset: 78 (98%), 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
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	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	1632	3316	1425	1641	3316	1396	1640	3283	1390
Satd. Flow (RTOR)			148			153			128			142
Lane Group Flow (vph)	100	1404	286	164	1416	199	193	417	79	171	663	164
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	2.4	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	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)	12.3	48.1	48.1	14.5	50.3	50.3	17.8	25.8	25.8	17.0	25.0	25.0
Actuated g/C Ratio	0.09	0.37	0.37	0.11	0.39	0.39	0.14	0.20	0.20	0.13	0.19	0.19
v/c Ratio	0.64	1.16	0.47	0.90	1.10	0.31	0.85	0.63	0.21	0.79	1.05	0.43
Control Delay	74.7	117.8	17.2	101.1	96.5	9.1	86.3	53.3	2.5	79.9	99.8	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.7	117.8	17.2	101.1	96.5	9.1	86.3	53.3	2.5	79.9	99.8	14.1
LOS	E	F	B	F	F	A	F	D	A	E	F	B
Approach Delay		99.3			87.2			56.7			82.3	
Approach LOS		F			F			E			F	
Queue Length 50th (m)	24.9	~223.8	25.5	42.0	~219.7	7.5	48.5	53.0	0.0	42.3	~100.8	4.7
Queue Length 95th (m)	43.2	#266.1	51.0	#82.6	#268.1	25.0	#86.3	70.8	2.6	#72.4	#138.3	25.1
Internal Link Dist (m)		142.5			157.3			109.7			89.2	
Turn Bay Length (m)	124.5		58.5	134.0		91.5			85.0	65.0		60.0
Base Capacity (vph)	187	1214	611	185	1282	645	239	659	380	239	632	382
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	0.53	1.16	0.47	0.89	1.10	0.31	0.81	0.63	0.21	0.72	1.05	0.43

Intersection Summary

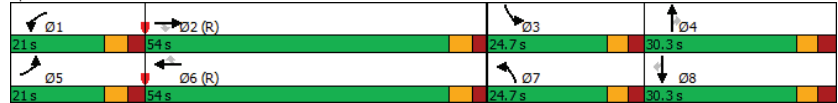
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 123 (95%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated

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

Existing
PM Peak Hour

Maximum v/c Ratio: 1.16	Intersection LOS: F
Intersection Signal Delay: 86.4	ICU Level of Service F
Intersection Capacity Utilization 94.7%	
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 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			284.9			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

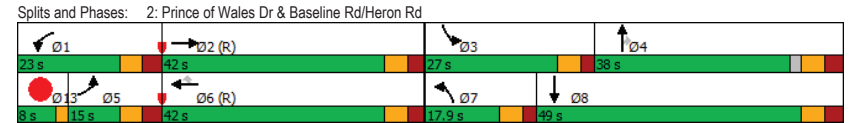
Existing
 PM Peak Hour

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 Signal Delay: 156.2	Intersection LOS: F
Intersection Capacity Utilization 106.2%	ICU Level of Service G
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			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	
Minimum Split (s)	31.1	31.1		31.1	31.1		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	
Total Split (%)	34.7%	34.7%		34.7%	34.7%		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	
All-Red Time (s)	4.1	4.1		4.1	4.1		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	
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	

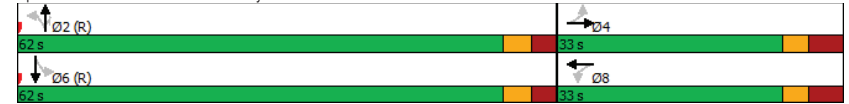
Intersection Summary	
Cycle Length:	95
Actuated Cycle Length:	95
Offset:	10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated

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

Existing
PM Peak Hour

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

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



Appendix D

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition
3/6/2015	2015	14:51	BASELINE RD btwn MARSON ST & FISHER AVE	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
3/27/2015	2015	8:20	BASELINE RD btwn MARSON ST & FISHER AVE	03 - Snow	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
12/2/2015	2015	18:23	BASELINE RD btwn MARSON ST & FISHER AVE	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
8/8/2017	2017	17:09	BASELINE RD btwn MARSON ST & FISHER AVE	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
9/12/2017	2017	10:35	BASELINE RD btwn MARSON ST & FISHER AVE	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
1/4/2017	2017	15:21	BASELINE RD btwn MARSON ST & FISHER AVE	03 - Snow	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	05 - Packed snow
1/24/2018	2018	18:06	BASELINE RD btwn MARSON ST & FISHER AVE (_32A4U)	01 - Clear	07 - Dark	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
6/19/2018	2018	6:40	BASELINE RD btwn MARSON ST & FISHER AVE (_32A4U)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
9/21/2018	2018	8:36	BASELINE RD btwn MARSON ST & FISHER AVE (_32A4U)	02 - Rain	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	02 - Wet
1/10/2019	2019	13:42	BASELINE RD btwn MARSON ST & FISHER AVE (_32A4U)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
1/10/2019	2019	13:04	BASELINE RD btwn MARSON ST & FISHER AVE (_32A4U)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
12/5/2019	2019	17:00	BASELINE RD btwn MARSON ST & FISHER AVE (_32A4U)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
7/14/2015	2015	16:33	FISHER AVE btwn MCCOOEY LANE & BASELINE RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
10/13/2015	2015	9:30	FISHER AVE btwn MCCOOEY LANE & BASELINE RD	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
10/27/2015	2015	10:43	FISHER AVE btwn MCCOOEY LANE & BASELINE RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
10/17/2016	2016	16:36	FISHER AVE btwn MCCOOEY LANE & BASELINE RD	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
3/23/2016	2016	17:56	FISHER AVE btwn MCCOOEY LANE & BASELINE RD	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
6/4/2016	2016	11:05	FISHER AVE btwn MCCOOEY LANE & BASELINE RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
10/27/2017	2017	10:19	FISHER AVE btwn MCCOOEY LANE & BASELINE RD	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
2/12/2018	2018	16:44	FISHER AVE btwn MCCOOEY LANE & BASELINE RD (_32A4S)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	05 - Packed snow
5/4/2018	2018	21:32	FISHER AVE btwn MCCOOEY LANE & BASELINE RD (_32A4S)	06 - Strong wind	07 - Dark	10 - No control		03 - P.D. only	07 - SMV other	01 - Dry
5/25/2018	2018	17:53	FISHER AVE btwn MCCOOEY LANE & BASELINE RD (_32A4S)	02 - Rain	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
12/6/2018	2018	8:54	FISHER AVE btwn MCCOOEY LANE & BASELINE RD (_32A4S)	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	07 - SMV other	02 - Wet
1/25/2019	2019	15:30	FISHER AVE btwn MCCOOEY LANE & BASELINE RD (_32A4S)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	04 - Slush
9/17/2019	2019	9:29	FISHER AVE btwn MCCOOEY LANE & BASELINE RD (_32A4S)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
1/2/2015	2015	20:32	FISHER AVE btwn BASELINE RD & MALIBU TER	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
5/29/2015	2015	7:50	FISHER AVE btwn BASELINE RD & MALIBU TER	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	99 - Other	01 - Dry
9/28/2015	2015	5:30	FISHER AVE btwn BASELINE RD & MALIBU TER	02 - Rain	07 - Dark	10 - No control		03 - P.D. only	03 - Rear end	02 - Wet
12/17/2015	2015	16:15	FISHER AVE btwn BASELINE RD & MALIBU TER	02 - Rain	05 - Dusk	10 - No control		03 - P.D. only	05 - Turning movement	02 - Wet
9/30/2015	2015	16:28	FISHER AVE btwn BASELINE RD & MALIBU TER	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
8/26/2016	2016	18:16	FISHER AVE btwn BASELINE RD & MALIBU TER	01 - Clear	01 - Daylight	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
10/22/2016	2016	8:27	FISHER AVE btwn BASELINE RD & MALIBU TER	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	05 - Turning movement	01 - Dry
12/7/2017	2017	17:30	FISHER AVE btwn BASELINE RD & MALIBU TER	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	02 - Angle	01 - Dry
4/30/2018	2018	17:22	FISHER AVE btwn BASELINE RD & MALIBU TER (_32A4X)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	99 - Other	01 - Dry
8/17/2019	2019	13:19	FISHER AVE btwn BASELINE RD & MALIBU TER (_32A4X)	02 - Rain	01 - Daylight	10 - No control		02 - Non-fatal injury	02 - Angle	02 - Wet
3/6/2015	2015	12:44	BASELINE RD btwn FISHER AVE & LEXINGTON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
4/22/2015	2015	9:30	BASELINE RD btwn FISHER AVE & LEXINGTON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	04 - Sideswipe	01 - Dry
5/11/2016	2016	17:43	BASELINE RD btwn FISHER AVE & LEXINGTON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
11/8/2016	2016	17:55	BASELINE RD btwn FISHER AVE & LEXINGTON ST	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
6/5/2017	2017	8:40	BASELINE RD btwn FISHER AVE & LEXINGTON ST	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
9/15/2018	2018	13:06	BASELINE RD btwn FISHER AVE & LEXINGTON ST (_32A4R)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
10/30/2018	2018	17:53	BASELINE RD btwn FISHER AVE & LEXINGTON ST (_32A4R)	01 - Clear	05 - Dusk	10 - No control		02 - Non-fatal injury	03 - Rear end	01 - Dry
2/12/2019	2019	17:47	BASELINE RD btwn FISHER AVE & LEXINGTON ST (_32A4R)	03 - Snow	05 - Dusk	10 - No control		03 - P.D. only	04 - Sideswipe	03 - Loose snow
6/25/2019	2019	15:49	BASELINE RD btwn FISHER AVE & LEXINGTON ST (_32A4R)	01 - Clear	01 - Daylight	10 - No control		03 - P.D. only	03 - Rear end	01 - Dry
11/10/2019	2019	20:17	BASELINE RD btwn FISHER AVE & LEXINGTON ST (_32A4R)	01 - Clear	07 - Dark	10 - No control		03 - P.D. only	99 - Other	01 - Dry
2/27/2015	2015	8:39	FISHER AVE @ MALIBU TER	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	02 - Angle	01 - Dry
2/14/2015	2015	20:39	FISHER AVE @ MALIBU TER	01 - Clear	07 - Dark	03 - P.D. only		05 - Turning movement	05 - Packed snow	01 - Dry
6/3/2015	2015	8:14	FISHER AVE @ MALIBU TER	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	02 - Angle	01 - Dry
9/30/2017	2017	10:05	FISHER AVE @ MALIBU TER	01 - Clear	01 - Daylight	02 - Stop sign		03 - P.D. only	02 - Angle	01 - Dry
2/15/2018	2018	16:01	FISHER AVE @ MALIBU TER (0003121)	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	05 - Turning movement	02 - Wet
10/18/2018	2018	8:00	FISHER AVE @ MALIBU TER (0003121)	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	07 - SMV other	01 - Dry
1/25/2019	2019	10:40	FISHER AVE @ MALIBU TER (0003121)	01 - Clear	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	03 - Rear end	02 - Wet
7/4/2015	2015	13:17	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	01 - Dry
2/4/2015	2015	10:15	BASELINE RD @ FISHER AVE	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
3/4/2015	2015	16:30	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
1/4/2015	2015	19:50	BASELINE RD @ FISHER AVE	04 - Freezing Rain	07 - Dark	01 - Traffic signal		03 - P.D. only	99 - Other	06 - Ice
8/18/2015	2015	17:10	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
3/6/2015	2015	16:32	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
3/15/2015	2015	7:37	BASELINE RD @ FISHER AVE	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	07 - SMV other	03 - Loose snow
2/19/2015	2015	13:10	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2/19/2015	2015	13:29	BASELINE RD @ FISHER AVE	05 - Drifting Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
6/23/2015	2015	8:45	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
3/27/2015	2015	19:37	BASELINE RD @ FISHER AVE	03 - Snow	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
5/13/2015	2015	10:38	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
4/26/2015	2015	11:30	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
6/26/2015	2015	14:56	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
11/12/2015	2015	16:50	BASELINE RD @ FISHER AVE	02 - Rain	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
9/18/2015	2015	17:51	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
8/9/2015	2015	14:16	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
12/31/2015	2015	16:43	BASELINE RD @ FISHER AVE	03 - Snow	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	03 - Loose snow
4/1/2016	2016	16:56	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
9/20/2016	2016	17:20	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
10/15/2016	2016	12:50	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
1/5/2016	2016	9:17	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
1/28/2016	2016	16:44	BASELINE RD @ FISHER AVE	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
7/16/2016	2016	20:52	BASELINE RD @ FISHER AVE	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
3/22/2016	2016	12:14	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
11/2/2016	2016	18:06	BASELINE RD @ FISHER AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
7/20/2016	2016	16:30	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
10/1/2016	2016	16:15	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
10/19/2016	2016	3:08	BASELINE RD @ FISHER AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
12/21/2016	2016	16:48	BASELINE RD @ FISHER AVE	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
11/26/2016	2016	21:20	BASELINE RD @ FISHER AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
7/21/2017	2017	9:19	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	04 - Sideswipe	01 - Dry
9/11/2017	2017	16:16	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
9/7/2017	2017	7:30	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	01 - Dry
10/6/2017	2017	9:29	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	01 - Dry
10/3/2017	2017	13:32	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
12/11/2017	2017	17:30	BASELINE RD @ FISHER AVE	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
12/6/2017	2017	16:43	BASELINE RD @ FISHER AVE	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
1/5/2017	2017	10:47	BASELINE RD @ FISHER AVE	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	02 - Non-fatal injury	05 - Packed snow
2/15/2017	2017	10:48	BASELINE RD @ FISHER AVE	03 - Snow						

Appendix E

TRANS Model Plots

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

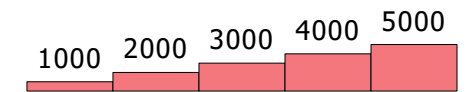
Plot Prepared: May 31, 2021

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 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

2011 Model - Base case

N/A

User Initials: TIMW

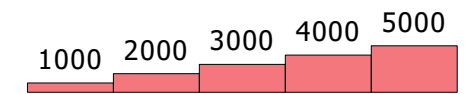
Plot Prepared: May 31, 2021

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 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

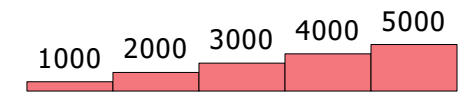
Plot Prepared: May 31, 2021

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 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

2011 Model - Base case

N/A

User Initials: TIMW

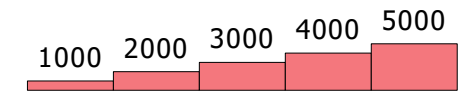
Plot Prepared: May 31, 2021

EMME Scenario: 21711

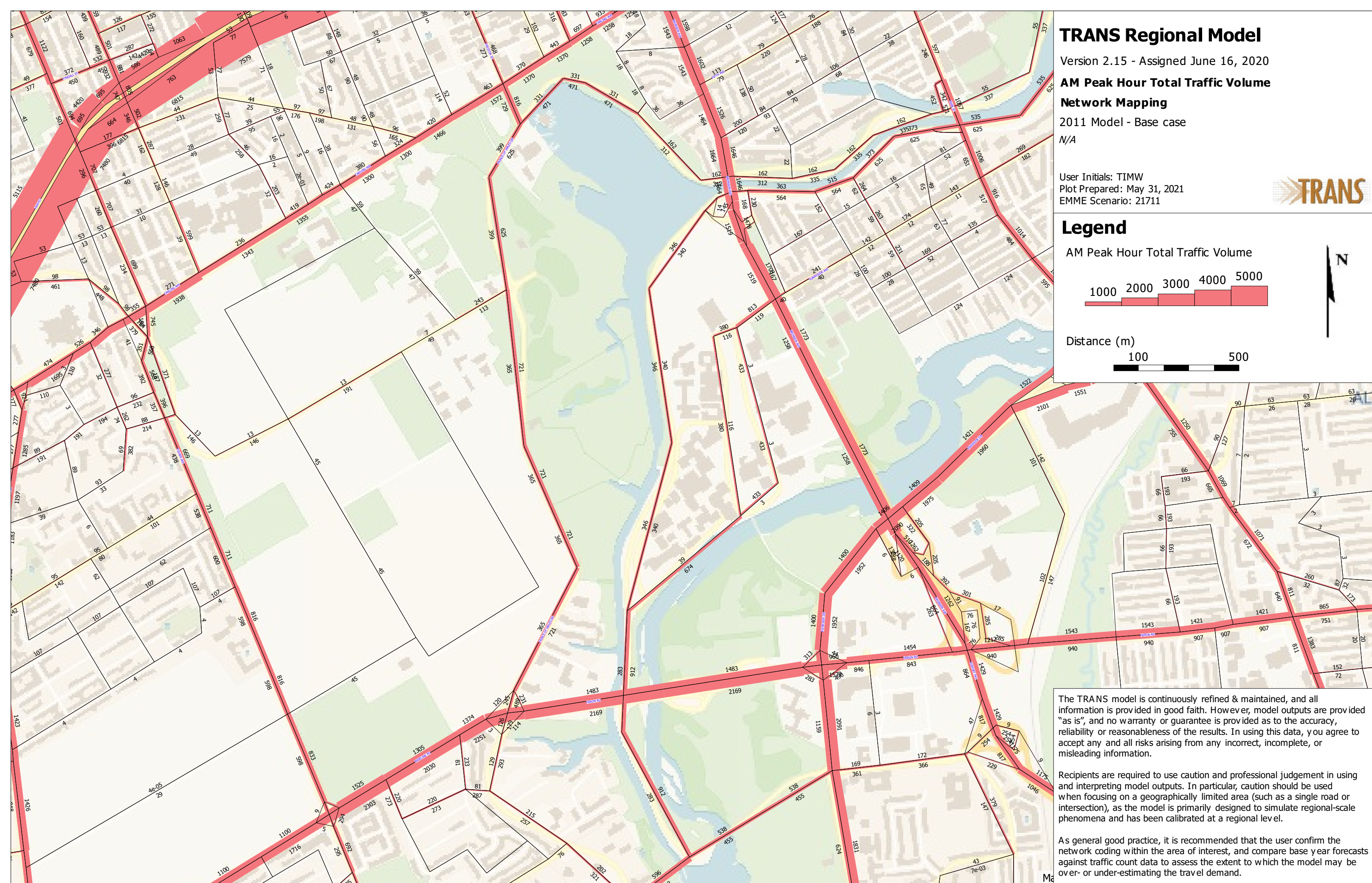


Legend

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.

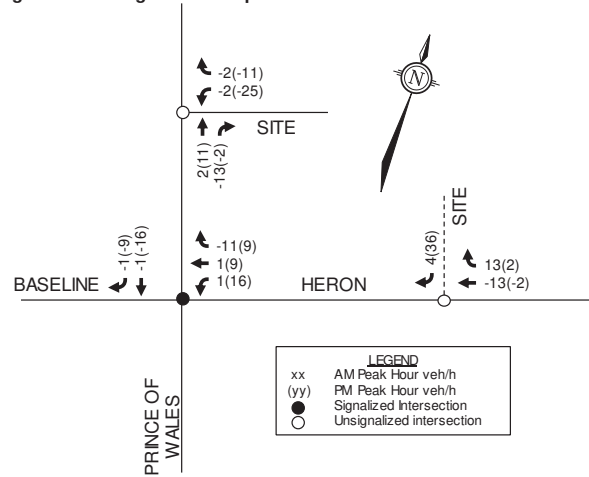
Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena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

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

Appendix F

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

Trip Generation by Mode – Existing Retail

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Retail (<40k sq. ft.)	Auto Driver	64%	15	10	25	60%	30	30	60
	Auto Passenger	9%	6	4	10	20%	30	30	60
	Transit	12%	8	5	13	9%	13	13	26
	Cycling	1%	1	0	1	0%	0	0	0
	Walking	14%	9	6	15	11%	16	16	32
	Pass-by	40%	-26	-17	-42	40%	-59	-59	-118
	Total	100%	39	25	64	100%	89	89	178

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	3173	0	1658	3111	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1654	3252	1345	1623	3252	1419	1625	3173	0	1636	3111	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						
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)	11.0	54.4	54.4	5.1	44.0	44.0	18.5	36.2		14.2	31.9	
Actuated g/C Ratio	0.08	0.42	0.42	0.04	0.34	0.34	0.14	0.28		0.11	0.25	
v/c Ratio	0.91	0.96	0.27	0.50	1.00	0.29	0.95	0.64		0.73	0.64	
Control Delay	113.2	53.7	29.3	65.5	94.9	66.5	102.1	44.7		78.9	47.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	113.2	53.7	29.3	65.5	94.9	66.5	102.1	44.7		78.9	47.4	
LOS	F	D	C	E	F	E	F	D		E	D	
Approach Delay		56.1			91.0			60.9			54.2	
Approach LOS		E			F			E			D	
Queue Length 50th (m)	32.8	~200.2	27.9	8.6	~166.5	37.7	57.4	66.0		32.8	56.7	
Queue Length 95th (m)	#73.4	#242.4	46.0	m10.6m	#169.6	m41.0	#105.9	85.6		#55.0	74.6	
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)	139	1361	563	64	1099	479	235	928		205	837	
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	0.91	0.96	0.27	0.50	1.00	0.29	0.95	0.61		0.64	0.58	

Intersection Summary

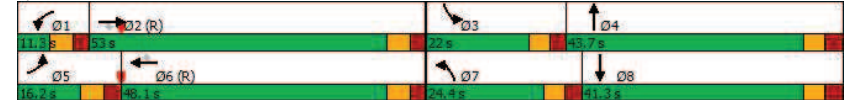
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated

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

2034 Future Background
AM Peak Hour

Maximum v/c Ratio: 1.00	Intersection LOS: E
Intersection Signal Delay: 67.2	ICU Level of Service G
Intersection Capacity Utilization 100.5%	
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.	

Splits and Phases: 1: Fisher Ave & Baseline Rd



Lanes, Volumes, Timings

2034 Future Background

6: Deer Park Rd/Dynes Rd & Fisher Ave

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:NBTL and 6:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated

Lanes, Volumes, Timings

2034 Future Background

6: Deer Park Rd/Dynes Rd & Fisher Ave

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	[Diagrammatic arrows for 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	3136	0	1610	3283	1483	1658	3225	0	3216	3202	0
Fit Permitted	0.950		0.950		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	1654	3136	0	1545	3283	1450	1626	3225	0	3177	3202	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		7	4		3	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	12.0		5.0	12.0	
Minimum Split (s)	11.8	29.5		11.8	29.8		10.9	37.8		10.9	37.8	
Total Split (s)	20.0	40.0		26.0	46.0		20.4	51.0		13.0	43.6	
Total Split (%)	15.4%	30.8%		20.0%	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	
All-Red Time (s)	3.1	2.8		3.1	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	
Total Lost Time (s)	6.8	5.8		6.8	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		None	Min		None	Min	
Act Effct Green (s)	13.2	34.2		19.2	39.5		10.8	44.2		7.1	43.0	
Actuated g/C Ratio	0.10	0.26		0.15	0.30		0.08	0.34		0.05	0.33	
v/c Ratio	1.20	0.83		0.95	1.02		0.53	1.19		1.26	0.45	
Control Delay	151.1	72.3		101.6	78.7		70.1	131.6		204.0	37.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	151.1	72.3		101.6	78.7		70.1	131.6		204.0	37.3	
LOS	F	E		F	E		F	F		F	D	
Approach Delay	90.3			108.0			128.3			90.1		
Approach LOS	F			F			F			F		
Queue Length 50th (m)	-64.4	98.4		57.9	-145.7		-173.4	18.0		-210.5	-36.5	52.1
Queue Length 95th (m)	m#75.7	m105.2		#107.1	#186.8		#240.9	32.9		#252.8	#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			74.0		
Base Capacity (vph)	168	825		237	997		440	184		1096	175	1058
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	0.83		0.95	1.02		0.39	1.19		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

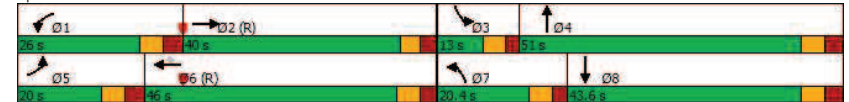
2034 Future Background

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

AM Peak Hour

Maximum v/c Ratio: 1.26	Intersection LOS: F
Intersection Signal Delay: 107.9	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 Background
PM Peak Hour

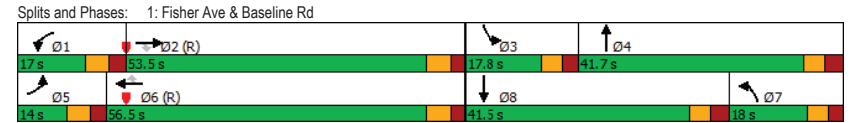
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	90	1358	257	148	1274	179	174	388	71	154	663	148
Future Volume (vph)	90	1358	257	148	1274	179	174	388	71	154	663	148
Satd. Flow (prot)	1658	3283	1483	1642	3316	1483	1658	3203	0	1658	3161	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1652	3283	1348	1622	3316	1431	1636	3203	0	1627	3161	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	0.52	1.10	0.99	0.32	1.09	0.53		1.02	0.96	
Control Delay	131.2	110.7	37.2	128.7	62.5	42.2	152.8	42.8		136.1	69.3	
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	37.2	128.7	62.5	42.2	152.8	42.8		136.1	69.3	
LOS	F	F	D	F	E	D	F	D		F	E	
Approach Delay		100.7			66.4			73.0			80.0	
Approach LOS		F			E			E			F	
Queue Length 50th (m)	23.4	~213.1	51.4	~43.6	130.7	33.5	~51.5	52.7		~40.8	107.7	
Queue Length 95th (m)	#56.4	#255.3	78.4	m#46.6	m123.2	m33.9	#96.8	69.7		#84.7	#146.7	
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	490	135	1283	553	159	872		151	855	
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	0.52	1.10	0.99	0.32	1.09	0.53		1.02	0.95	

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 Signal Delay:	81.9
Intersection LOS:	F
Intersection Capacity Utilization:	106.9%
ICU Level of Service:	G
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.	



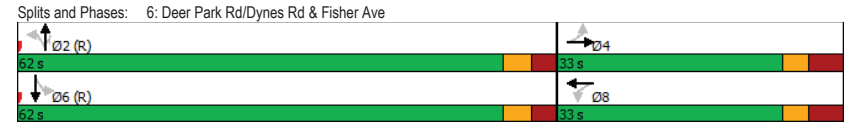
Lanes, Volumes, Timings
 6: Deer Park Rd/Dynes Rd & Fisher Ave 2034 Future Background
 PM Peak Hour

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	SBR	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	3095	0	1658	3316	1483	1610	3267	0	3185	3176	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1647	3095	0	1560	3316	1413	1579	3267	0	3146	3176	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	0.88		0.98	1.13	0.99	0.53	1.21		0.85	0.76	
Control Delay	126.9	64.2		100.0	110.9	83.4	70.1	139.6		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	126.9	64.2		100.0	110.9	83.4	70.1	139.6		110.7	44.3	
LOS	F	E		F	F	F	E	F		F	D	
Approach Delay		75.0			102.9			136.2			52.0	
Approach LOS		E			F			F			D	
Queue Length 50th (m)	~32.7	74.0		78.1	~186.2	113.2	19.6	~252.1		14.1	96.2	
Queue Length 95th (m)	m#28.5	m#7.1		#135.5	#228.2	#180.7	36.2	#294.7		#31.1	120.3	
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	583		308	1058	451	149	1261		124	1056	
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	1.13	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

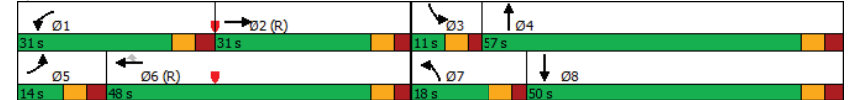
2034 Future Background

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

PM Peak Hour

Maximum v/c Ratio: 1.21	Intersection LOS: F
Intersection Signal Delay: 101.0	ICU Level of Service H
Intersection Capacity Utilization 112.3%	
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



Appendix I

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)	123	1290	157	39	1103	141	237	516	107	132	399	93
Future Volume (vph)	123	1290	157	39	1103	141	237	516	107	132	399	93
Satd. Flow (prot)	1658	3252	1469	1642	3252	1455	1658	3097	0	1658	3061	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1653	3252	1082	1573	3252	1406	1550	3097	0	1575	3061	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	123	1290	157	39	1103	141	237	623	0	132	492	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	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)	9.9	49.1	49.1	5.0	41.9	41.9	18.5	39.3		14.2	35.0	
Actuated g/C Ratio	0.08	0.38	0.38	0.04	0.32	0.32	0.14	0.30		0.11	0.27	
v/c Ratio	0.98	1.05	0.38	0.62	1.05	0.31	1.01	0.66		0.73	0.60	
Control Delay	133.6	80.0	34.1	72.7	108.2	67.4	116.0	44.2		78.9	44.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	133.6	80.0	34.1	72.7	108.2	67.4	116.0	44.2		78.9	44.9	
LOS	F	F	C	E	F	E	F	D		E	D	
Approach Delay		79.6			102.7			64.0			52.1	
Approach LOS		E			F			E			D	
Queue Length 50th (m)	32.0	~197.3	29.9	10.4	~167.2	37.7	~62.0	74.7		32.8	58.0	
Queue Length 95th (m)	#71.3	#239.6	50.0	m12.9	m#168.6	m41.2	#114.5	96.1		#55.0	76.3	
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)	126	1227	408	63	1048	453	235	937		205	824	
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	0.98	1.05	0.38	0.62	1.05	0.31	1.01	0.66		0.64	0.60	

Intersection Summary

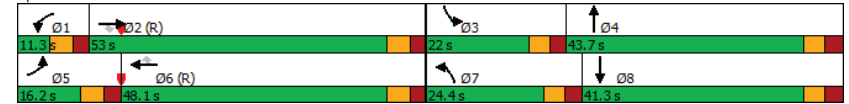
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated

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

2034 Future Total
AM Peak Hour

Maximum v/c Ratio: 1.05	Intersection LOS: E
Intersection Signal Delay: 79.4	ICU Level of Service G
Intersection Capacity Utilization 105.1%	
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: 1: Fisher Ave & Baseline Rd



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	672	171	61	558	5
Future Volume (vph)	38	83	17	83	41	104	8	672	171	61	558	5
Satd. Flow (prot)	0	1659	0	0	1575	0	0	1710	1483	0	3292	0
Fit Permitted		0.849			0.843			0.993			0.800	
Satd. Flow (perm)	0	1420	0	0	1333	0	0	1699	1277	0	2646	0
Satd. Flow (RTOR)		9			56			171			1	
Lane Group Flow (vph)	0	138	0	0	228	0	0	680	171	0	624	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			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		
Minimum Split (s)	31.1	31.1		31.1	31.1		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		
Total Split (%)	41.3%	41.3%		41.3%	41.3%		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		
All-Red Time (s)	4.1	4.1		4.1	4.1		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			0.64			0.67	0.21		0.40	
Control Delay		25.9			27.6			16.8	2.3		10.6	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		25.9			27.6			16.8	2.3		10.6	
LOS		C			C			B	A		B	
Approach Delay		25.9			27.6			13.9			10.6	
Approach LOS		C			C			B			B	
Queue Length 50th (m)		15.0			21.1			75.0	0.0		28.3	
Queue Length 95th (m)		29.4			42.2			118.3	8.2		40.5	
Internal Link Dist (m)		152.1			156.9			172.3			30.0	
Turn Bay Length (m)												
Base Capacity (vph)		465			469			1013	830		1578	
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	0.21		0.40	

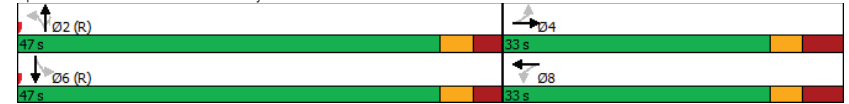
Intersection Summary												
Cycle Length: 80												
Actuated Cycle Length: 80												
Offset: 78 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

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

2034 Future Total
AM Peak Hour

Maximum v/c Ratio: 0.67	Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 94.3%	ICU Level of Service F	
Analysis Period (min) 15		

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



Lanes, Volumes, Timings

2034 Future Total

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)	209	556	142	225	1025	546	72	1134	166	221	394	86						
Future Volume (vph)	209	556	142	225	1025	546	72	1134	166	221	394	86						
Satd. Flow (prot)	1658	3128	0	1610	3283	1483	1658	3225	0	3216	3198	0						
Fit Permitted	0.950			0.950			0.950			0.950								
Satd. Flow (perm)	1654	3128	0	1541	3283	1445	1626	3225	0	3177	3198	0						
Satd. Flow (RTOR)																		
Lane Group Flow (vph)	209	698	0	225	1025	546	72	1300	0	221	480	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		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	1.24	0.85		0.95	1.03	1.24	0.53	1.19		1.26	0.45							
Control Delay	161.3	73.3		101.6	80.2	166.3	70.1	131.6		204.0	37.4							
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0							
Total Delay	161.3	73.3		101.6	80.2	166.3	70.1	131.6		204.0	37.4							
LOS	F	E		F	F	F	E	F		F	D							
Approach Delay		93.6			109.1			128.3			89.9							
Approach LOS		F			F			F			F							
Queue Length 50th (m)	~68.7	100.7		57.9	~147.4	~173.8	18.0	~210.5		~36.5	52.5							
Queue Length 95th (m)	m#71.8	m99.5		#107.1	#188.5	#241.3	32.9	#252.8		#62.3	72.0							
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	822		237	997	439	184	1096		175	1057							
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	1.24	0.85		0.95	1.03	1.24	0.39	1.19		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

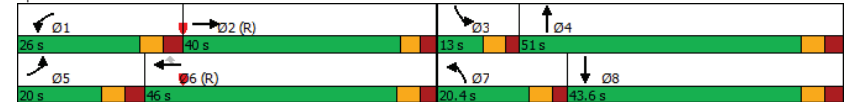
2034 Future Total

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

AM Peak Hour

Maximum v/c Ratio: 1.26	Intersection LOS: F
Intersection Signal Delay: 108.9	ICU Level of Service H
Intersection Capacity Utilization 109.5%	
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.	

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

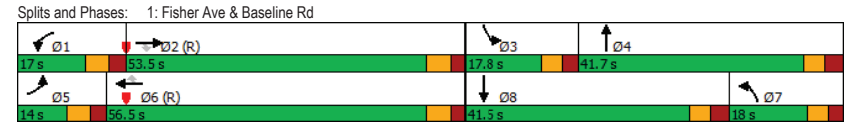
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	82	1333	265	160	1278	179	175	402	104	154	676	148
Future Volume (vph)	82	1333	265	160	1278	179	175	402	104	154	676	148
Satd. Flow (prot)	1658	3283	1483	1642	3316	1483	1658	3110	0	1658	3112	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1650	3283	1086	1575	3316	1414	1591	3110	0	1558	3112	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	82	1333	265	160	1278	179	175	506	0	154	824	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	12.1	35.4		11.9	35.2	
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	0.84	1.12	0.67	1.19	1.00	0.33	1.14	0.60		1.02	0.98	
Control Delay	114.6	102.9	44.8	156.0	62.9	42.2	165.6	44.6		136.1	73.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	114.6	102.9	44.8	156.0	62.9	42.2	165.6	44.6		136.1	73.3	
LOS	F	F	D	F	E	D	F	D		F	E	
Approach Delay		94.3			69.8			75.7			83.2	
Approach LOS		F			E			E			F	
Queue Length 50th (m)	21.2	~206.1	56.8	~50.1	131.3	33.6	~52.1	59.4		~40.8	110.6	
Queue Length 95th (m)	#50.5	#248.3	89.1	m#52.7	m123.0	m33.4	#97.8	77.9		#84.7	#152.3	
Internal Link Dist (m)		192.5			794.8			136.1			126.1	
Turn Bay Length (m)	124.5		100.0	134.0		91.5	127.0			65.0		
Base Capacity (vph)	98	1194	395	135	1283	547	154	846		151	842	
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	0.84	1.12	0.67	1.19	1.00	0.33	1.14	0.60		1.02	0.98	

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:	1.19
Intersection Signal Delay:	81.6
Intersection LOS:	F
Intersection Capacity Utilization:	108.2%
ICU Level of Service:	G
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	579	29	54	900	34
Future Volume (vph)	17	17	14	74	68	90	12	579	29	54	900	34
Satd. Flow (prot)	0	1637	0	0	1608	0	0	1743	1483	0	3244	0
Fit Permitted		0.830			0.875			0.976			0.885	
Satd. Flow (perm)	0	1376	0	0	1425	0	0	1702	1418	0	2878	0
Satd. Flow (RTOR)		14			33			47			6	
Lane Group Flow (vph)	0	48	0	0	232	0	0	591	29	0	988	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			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		0.52	
Control Delay		23.6			46.2			11.4	1.3		10.2	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		23.6			46.2			11.4	1.3		10.2	
LOS		C			D			B	A		B	
Approach Delay		23.6			46.2			10.9			10.2	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		5.2			34.7			49.9	0.0		43.3	
Queue Length 95th (m)		13.1			54.8			94.8	2.1		72.9	
Internal Link Dist (m)		145.0			146.3			187.2			22.4	
Turn Bay Length (m)												
Base Capacity (vph)		385			412			1130	957		1914	
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		0.52	

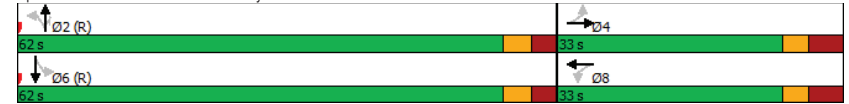
Intersection Summary	
Cycle Length:	95
Actuated Cycle Length:	95
Offset:	10 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated

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

2034 Future Total
PM Peak Hour

Maximum v/c Ratio: 0.76	Intersection LOS: B
Intersection Signal Delay: 15.2	ICU Level of Service F
Intersection Capacity Utilization 97.3%	
Analysis Period (min) 15	

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



Lanes, Volumes, Timings

2034 Future Total

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

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	110	394	125	303	1205	445	79	1429	102	106	647	160
Future Volume (vph)	110	394	125	303	1205	445	79	1429	102	106	647	160
Satd. Flow (prot)	1658	3080	0	1658	3316	1483	1610	3267	0	3185	3172	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1647	3080	0	1547	3316	1406	1579	3267	0	3146	3172	0
Satd. Flow (RTOR)												
Lane Group Flow (vph)	110	519	0	303	1205	445	79	1531	0	106	807	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	1.21	0.89		0.98	1.14	0.99	0.53	1.21		0.85	0.76	
Control Delay	140.7	63.4		100.0	114.7	85.2	70.1	139.6		110.7	44.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	140.7	63.4		100.0	114.7	85.2	70.1	139.6		110.7	44.6	
LOS	F	E		F	F	F	E	F		F	D	
Approach Delay		76.9			105.7			136.2			52.2	
Approach LOS		E			F			F			D	
Queue Length 50th (m)	~34.2	74.7		78.1	~189.2	113.5	19.6	~252.1		14.1	97.0	
Queue Length 95th (m)	m#32.2	m#69.1		#135.5	#231.3	#181.3	36.2	#294.7		#31.1	121.4	
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	580		308	1058	448	149	1261		124	1055	
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	1.21	0.89		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

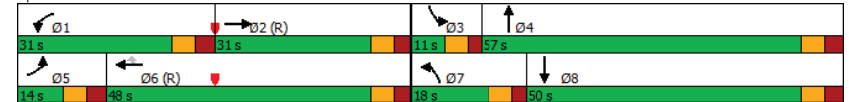
2034 Future Total

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

PM Peak Hour

Maximum v/c Ratio: 1.21	Intersection LOS: F
Intersection Signal Delay: 102.2	ICU Level of Service H
Intersection Capacity Utilization 112.8%	
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



Appendix J

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

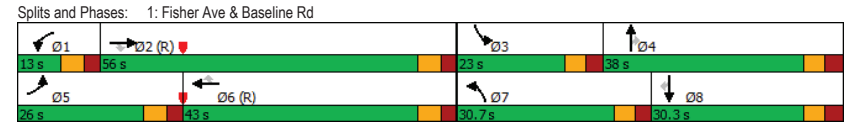
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↔	↕	↕	↔	↕	↕	↔	↕	↕
Traffic Volume (vph)	123	1290	159	45	1103	141	244	525	118	132	404	93
Future Volume (vph)	123	1290	159	45	1103	141	244	525	118	132	404	93
Satd. Flow (prot)	1658	3252	1469	1642	3252	1455	1658	3252	1483	1658	3221	1483
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1652	3252	1228	1600	3252	1411	1533	3252	1410	1647	3221	1264
Satd. Flow (RTOR)			180				232			181		231
Lane Group Flow (vph)	123	1290	159	45	1103	141	244	525	118	132	404	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	C-Max	C-Max	None	None	None	None	None	None
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	14.7	54.6	54.6	6.7	44.1	44.1	22.6	32.1	32.1	14.5	24.0	24.0
Actuated g/C Ratio	0.11	0.42	0.42	0.05	0.34	0.34	0.17	0.25	0.25	0.11	0.18	0.18
v/c Ratio	0.66	0.95	0.26	0.54	1.00	0.22	0.85	0.66	0.24	0.71	0.68	0.22
Control Delay	71.1	52.0	3.6	79.6	39.3	9.1	77.5	48.5	1.8	76.5	56.0	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	71.1	52.0	3.6	79.6	39.3	9.1	77.5	48.5	1.8	76.5	56.0	1.2
LOS	E	D	A	E	D	A	E	D	A	E	E	A
Approach Delay		48.6			37.4			50.3			52.2	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	30.6	~186.5	0.0	8.6	~167.0	20.2	59.9	63.1	0.0	32.8	51.3	0.0
Queue Length 95th (m)	49.2	#228.7	10.0	m7.5	m104.9	m11.7	#97.3	83.5	2.0	53.7	68.9	0.0
Internal Link Dist (m)		115.4			156.7			86.9			100.0	
Turn Bay Length (m)	124.5		58.5	134.0		91.5			85.0	65.0		60.0
Base Capacity (vph)	251	1364	619	86	1104	632	316	804	484	218	594	421
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	0.49	0.95	0.26	0.52	1.00	0.22	0.77	0.65	0.24	0.61	0.68	0.22

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: 1.00	Intersection LOS: D
Intersection Signal Delay: 46.1	ICU Level of Service F
Intersection Capacity Utilization 96.0%	
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

2034 Future Total-without BRT

6: Deer Park Rd/Dynes Rd & Fisher Ave

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	674	171	61	567	5
Future Volume (vph)	38	83	17	83	41	104	8	674	171	61	567	5
Satd. Flow (prot)	0	1660	0	0	1577	0	0	1710	1483	0	3293	0
Fit Permitted		0.849			0.843			0.993			0.800	
Satd. Flow (perm)	0	1421	0	0	1336	0	0	1699	1289	0	2647	0
Satd. Flow (RTOR)		9			56			171			1	
Lane Group Flow (vph)	0	138	0	0	228	0	0	682	171	0	633	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		0.40	
Control Delay		25.9			27.5			16.8	2.3		10.6	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		25.9			27.5			16.8	2.3		10.6	
LOS		C			C			B	A		B	
Approach Delay		25.9			27.5			13.9			10.6	
Approach LOS		C			C			B			B	
Queue Length 50th (m)		15.0			21.1			75.4	0.0		28.8	
Queue Length 95th (m)		29.4			42.2			118.8	8.2		41.2	
Internal Link Dist (m)		152.1			156.9			172.3			30.0	
Turn Bay Length (m)												
Base Capacity (vph)		466			470			1013	837		1579	
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		0.40	

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

Lanes, Volumes, Timings

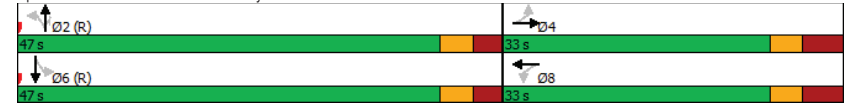
2034 Future Total-without BRT

6: Deer Park Rd/Dynes Rd & Fisher Ave

AM Peak Hour

Maximum v/c Ratio: 0.67	Intersection LOS: B
Intersection Signal Delay: 15.4	ICU Level of Service F
Intersection Capacity Utilization 94.5%	
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-without BRT
 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	563	142	225	1029	546	72	1134	166	221	394	88
Future Volume (vph)	213	563	142	225	1029	546	72	1134	166	221	394	88
Satd. Flow (prot)	1658	4584	0	1610	3283	1483	1658	3316	1469	1658	3215	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1654	4584	0	1593	3283	1449	1653	3316	1428	1654	3215	0
Satd. Flow (RTOR)		45				449			170			19
Lane Group Flow (vph)	213	705	0	225	1029	546	72	1134	166	221	482	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	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	Lead	Lag	Lag	Lead	Lag	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	34.1		21.3	23.5	23.5	11.0	31.2	31.2	18.1	40.8	
Actuated g/C Ratio	0.12	0.26		0.16	0.18	0.18	0.08	0.24	0.24	0.14	0.31	
v/c Ratio	1.10	0.57		0.86	1.74	0.87	0.51	1.43	0.35	0.96	0.47	
Control Delay	147.0	23.3		80.8	370.2	25.5	69.1	236.0	7.6	105.6	37.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	147.0	23.3		80.8	370.2	25.5	69.1	236.0	7.6	105.6	37.7	
LOS	F	C		F	F	C	E	F	A	F	D	
Approach Delay		52.0			229.5			199.6			59.1	
Approach LOS		D			F			F			E	
Queue Length 50th (m)	-61.7	31.4		55.7	-205.1	23.9	18.0	-206.2	0.0	57.0	51.7	
Queue Length 95th (m)	m#75.0	m35.8		#93.9	#246.3	#90.0	32.6	#247.9	16.6	#106.2	72.1	
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	1235		287	593	629	230	795	471	230	1022	
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	1.10	0.57		0.78	1.74	0.87	0.31	1.43	0.35	0.96	0.47	

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
 8: Prince of Wales Dr & Baseline Rd/Heron Rd
 2034 Future Total-without BRT
 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

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

2034 Future Total-without BRT

AM Peak Hour

Maximum v/c Ratio: 1.74	Intersection LOS: F
Intersection Signal Delay: 161.9	ICU Level of Service H
Intersection Capacity Utilization 110.2%	
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.	

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



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)	82	1333	270	173	1278	179	182	410	114	154	686	148
Future Volume (vph)	82	1333	270	173	1278	179	182	410	114	154	686	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)	1648	3283	1227	1600	3316	1413	1578	3316	1385	1632	3283	1253
Satd. Flow (RTOR)			147			152			128			128
Lane Group Flow (vph)	82	1333	270	173	1278	179	182	410	114	154	686	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	2.4	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	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)	11.4	47.9	47.9	14.7	51.2	51.2	17.3	26.7	26.7	16.1	25.5	25.5
Actuated g/C Ratio	0.09	0.37	0.37	0.11	0.39	0.39	0.13	0.21	0.21	0.12	0.20	0.20
v/c Ratio	0.57	1.10	0.50	0.94	0.98	0.28	0.82	0.60	0.30	0.75	1.07	0.43
Control Delay	71.4	97.5	17.3	108.2	59.6	7.4	83.1	51.8	7.7	77.2	104.1	14.8
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	71.4	97.5	17.3	108.2	59.6	7.4	83.1	51.8	7.7	77.2	104.1	14.8
LOS	E	F	B	F	E	A	F	D	A	E	F	B
Approach Delay	83.4			59.0			52.7			86.5		
Approach LOS	F			E			D			F		
Queue Length 50th (m)	20.5	~203.9	23.0	44.6	169.0	4.3	45.4	51.2	0.0	38.3	~107.2	4.3
Queue Length 95th (m)	36.4	#246.2	48.9	#87.9	#228.8	20.2	#79.4	69.6	12.6	60.8	#145.3	23.9
Internal Link Dist (m)	142.5			143.6			85.7			78.9		
Turn Bay Length (m)	124.5		58.5	134.0		91.5			85.0	65.0		60.0
Base Capacity (vph)	187	1209	544	185	1305	648	239	681	386	239	643	348
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	0.44	1.10	0.50	0.94	0.98	0.28	0.76	0.60	0.30	0.64	1.07	0.43

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: 1.10	Intersection LOS: E
Intersection Signal Delay: 71.8	ICU Level of Service G
Intersection Capacity Utilization 100.2%	
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.	

Splits and Phases: 1: Fisher Ave & Baseline Rd



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

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)	17	17	14	74	68	90	12	584	29	54	908	34
Future Volume (vph)	17	17	14	74	68	90	12	584	29	54	908	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	596	29	0	996	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		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			0.53	0.03		0.52	
Control Delay		23.6			45.9			11.5	1.3		10.2	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		23.6			45.9			11.5	1.3		10.2	
LOS		C			D			B	A		B	
Approach Delay		23.6			45.9			11.0			10.2	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		5.2			34.7			50.5	0.0		43.8	
Queue Length 95th (m)		13.1			54.7			96.1	2.1		73.6	
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			0.53	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-without BRT
PM Peak Hour

Maximum v/c Ratio: 0.76	Intersection LOS: B
Intersection Signal Delay: 15.2	ICU Level of Service F
Intersection Capacity Utilization 97.4%	
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-without BRT
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕	↔	↔	↕↕	↔	↔	↕↕	↔	↔	↕↕	↔
Traffic Volume (vph)	113	401	125	303	1213	445	79	1429	102	106	647	165
Future Volume (vph)	113	401	125	303	1213	445	79	1429	102	106	647	165
Satd. Flow (prot)	1658	4532	0	1658	3316	1483	1610	3316	1483	1642	3190	0
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1647	4532	0	1622	3316	1412	1596	3316	1420	1635	3190	0
Satd. Flow (RTOR)		58					383		199		25	
Lane Group Flow (vph)	113	526	0	303	1213	445	79	1429	102	106	812	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	40.4	40.4	13.8	42.2	
Actuated g/C Ratio	0.06	0.27		0.12	0.27	0.27	0.09	0.31	0.31	0.10	0.32	
v/c Ratio	1.10	0.42		1.49	1.36	0.68	0.54	1.41	0.18	0.62	0.78	
Control Delay	173.0	36.2		285.1	207.0	12.7	71.7	224.8	0.7	71.3	45.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	173.0	36.2		285.1	207.0	12.7	71.7	224.8	0.7	71.3	45.7	
LOS	F	D		F	F	B	E	F	A	E	D	
Approach Delay		60.4			175.0			203.1			48.7	
Approach LOS		E			F			F			D	
Queue Length 50th (m)	-33.2	36.7		-108.7	-218.0	12.4	20.0	-261.9	0.0	26.8	98.0	
Queue Length 95th (m)	#71.6	48.0		#165.4	#260.1	49.1	36.9	#323.8	0.0	44.1	122.4	
Internal Link Dist (m)		190.6			284.9			145.3			127.9	
Turn Bay Length (m)	125.0			115.0		243.0	117.0		40.0	66.0		
Base Capacity (vph)	103	1262		203	892	659	146	1015	572	262	1037	
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	1.10	0.42		1.49	1.36	0.68	0.54	1.41	0.18	0.40	0.78	

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

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

2034 Future Total-without BRT

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

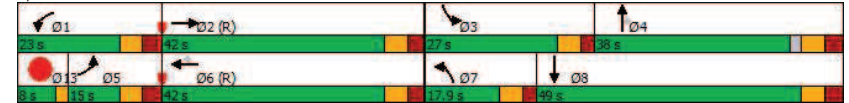
8: Prince of Wales Dr & Baseline Rd/Heron Rd

2034 Future Total-without BRT

PM Peak Hour

Maximum v/c Ratio: 1.49	
Intersection Signal Delay: 146.9	Intersection LOS: F
Intersection Capacity Utilization 111.6%	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.	

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



Appendix K

TDM Checklist

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

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

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

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

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
4. RIDESHARING		
4.1 Ridematching service		
<i>Commuter travel</i>		
BASIC ★	4.1.1 Provide a dedicated ridematching portal at OttawaRideMatch.com	<input type="checkbox"/>
4.2 Carpool parking price incentives		
<i>Commuter travel</i>		
BETTER	4.2.1 Provide discounts on parking costs for registered carpools	<input type="checkbox"/>
4.3 Vanpool service		
<i>Commuter travel</i>		
BETTER	4.3.1 Provide a vanpooling service for long-distance commuters	<input type="checkbox"/>
5. CARSHARING & BIKESHARING		
5.1 Bikeshare stations & memberships		
BETTER	5.1.1 Contract with provider to install on-site bikeshare station for use by commuters and visitors	<input type="checkbox"/>
<i>Commuter travel</i>		
BETTER	5.1.2 Provide employees with bikeshare memberships for local business travel	<input type="checkbox"/>
5.2 Carshare vehicles & memberships		
<i>Commuter travel</i>		
BETTER	5.2.1 Contract with provider to install on-site carshare vehicles and promote their use by tenants	<input type="checkbox"/>
BETTER	5.2.2 Provide employees with carshare memberships for local business travel	<input type="checkbox"/>
6. PARKING		
6.1 Priced parking		
<i>Commuter travel</i>		
BASIC ★	6.1.1 Charge for long-term parking (daily, weekly, monthly)	<input 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
7. TDM MARKETING & COMMUNICATIONS		
7.1 Multimodal travel information		
<i>Commuter travel</i>		
BASIC ★	7.1.1 Provide a multimodal travel option information package to new/relocating employees and students	<input checked="" type="checkbox"/>
<i>Visitor travel</i>		
BETTER ★	7.1.2 Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	<input type="checkbox"/>
7.2 Personalized trip planning		
<i>Commuter travel</i>		
BETTER ★	7.2.1 Offer personalized trip planning to new/relocating employees	<input type="checkbox"/>
7.3 Promotions		
<i>Commuter travel</i>		
BETTER	7.3.1 Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	<input type="checkbox"/>
8. OTHER INCENTIVES & AMENITIES		
8.1 Emergency ride home		
<i>Commuter travel</i>		
BETTER ★	8.1.1 Provide emergency ride home service to non-driving commuters	<input type="checkbox"/>
8.2 Alternative work arrangements		
<i>Commuter travel</i>		
BASIC ★	8.2.1 Encourage flexible work hours	<input type="checkbox"/>
BETTER	8.2.2 Encourage compressed workweeks	<input type="checkbox"/>
BETTER ★	8.2.3 Encourage telework	<input type="checkbox"/>
8.3 Local business travel options		
<i>Commuter travel</i>		
BASIC ★	8.3.1 Provide local business travel options that minimize the need for employees to bring a personal car to work	<input type="checkbox"/>
8.4 Commuter incentives		
<i>Commuter travel</i>		
BETTER	8.4.1 Offer employees a taxable, mode-neutral commuting allowance	<input type="checkbox"/>
8.5 On-site amenities		
<i>Commuter travel</i>		
BETTER	8.5.1 Provide on-site amenities/services to minimize mid-day or mid-commute errands	<input type="checkbox"/>

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

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

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

TDM measures: Residential developments		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances (<i>multi-family, condominium</i>)	<input checked="" type="checkbox"/>
BETTER	3.1.2 Provide real-time arrival information display at entrances (<i>multi-family, condominium</i>)	<input checked="" type="checkbox"/>
3.2 Transit fare incentives		
BASIC ★	3.2.1 Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	<input type="checkbox"/>
BETTER	3.2.2 Offer at least one year of free monthly transit passes on residence purchase/move-in	<input checked="" type="checkbox"/> For each residential unit
3.3 Enhanced public transit service		
BETTER ★	3.3.1 Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels (<i>subdivision</i>)	<input type="checkbox"/>
3.4 Private transit service		
BETTER	3.4.1 Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	<input type="checkbox"/>
4. CARSHARING & BIKESHARING		
4.1 Bikeshare stations & memberships		
BETTER	4.1.1 Contract with provider to install on-site bikeshare station (<i>multi-family</i>)	<input checked="" type="checkbox"/>
BETTER	4.1.2 Provide residents with bikeshare memberships, either free or subsidized (<i>multi-family</i>)	<input type="checkbox"/>
4.2 Carshare vehicles & memberships		
BETTER	4.2.1 Contract with provider to install on-site carshare vehicles and promote their use by residents	<input checked="" type="checkbox"/>
BETTER	4.2.2 Provide residents with carshare memberships, either free or subsidized	<input type="checkbox"/>
5. PARKING		
5.1 Priced parking		
BASIC ★	5.1.1 Unbundle parking cost from purchase price (<i>condominium</i>)	<input checked="" type="checkbox"/>
BASIC ★	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
6. TDM MARKETING & COMMUNICATIONS		
6.1 Multimodal travel information		
BASIC ★	6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
6.2 Personalized trip planning		
BETTER ★	6.2.1 Offer personalized trip planning to new residents	<input type="checkbox"/>

Appendix L

MMLOS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation Inc.	Project	2021-083
Scenario	Existing/Future	Date	5/30/2023
Comments			

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 (RTOR) ?	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
	Corner Radius	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	10-15m	10-15m	10-15m	15-25m	10-15m
	Crosswalk Type	Std transverse 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	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
	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	#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	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	36	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	E	E	D	E	E	E	E	A	A	A	A	
Level of Service	F	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 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	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	> 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	>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	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	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 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	> 50 to < 60 km/h	
Left Turning Cyclist	F	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	F	A	A	A	A	A	A	A	A	A	A	A	A	
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	> 40 sec	≤ 20 sec	≤ 20 sec	-	-	
Level of Service	F	F	F	F	-	F	F	F	F	F	F	F	F	-	F	F	F	C	C	-	-	
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	> 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	≥ 2	-	-	-	-	
Level of Service	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	-	-	-	-	
Volume to Capacity Ratio		> 1.00				> 1.00					> 1.00				> 1.00						0.61 - 0.70	
Level of Service		F				F					F				F						B	