TRANSPORTATION PLANNERS AND ENGINEERS

bunt &associates

Damkar Seniors 2020

Transportation Impact Assessment

Revised Final

Prepared for

Trico Development (1990) Ltd.

Date

July 20, 2020

Project Number

02-20-0012

CORPORATE AUTHORIZATION

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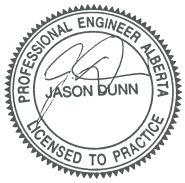

2020-07-20

Engineer's Stamp

This document entitled "Damkar Seniors 2020 Transportation Impact Assessment" was prepared by Bunt & Associates for the benefit of the client to whom it is addressed, in support of their Conceptual Scheme Amendment and Land Use Redesignation application to the Rocky View County. The analysis and conclusions/recommendations in the report reflect Bunt & Associates' best professional judgment in light of the knowledge and information available to Bunt & Associates at the time of preparation.

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1. EXECUTIVE SUMMARY

B & A Planning Group, on behalf of Trico Development (1990) Ltd., is seeking approval of a conceptual scheme amendment and land use re-designation for a site located off Damkar Court, adjacent to 12 Mile Coulee Road NW in the Rocky View County (RVC). The proposed development will have 237 residential units designated as Adult (55+) Housing and a 114 unit or bed Congregate Care facility.

RVC requested a Transportation Impact Assessment (TIA) to review the traffic impacts of the proposed development. Findings and recommendations are summarized below.

1.1 Trip Generation

Proposed development densities, phasing, and forecasted trip generation is summarized in Table 1.1.

Table 1.1: Trip Generation

USE	DENSITY	TOTAL TRIP GENERATION	
		AM Peak Hour	PM Peak Hour
Adult (55+) Housing - Attached	286 units	57	74
Congregate Care Facility	114 units	8	21
	TOTAL	65	95

The latest site plan indicates 237 Senior Adult Housing units rather than the 286 units from an earlier plan that had been used for the analysis. As the analysis based on the 286 units produces more trips than the current 237 unit plan, the analysis was not updated as the results are conservative.

1.2 Findings & Recommendations

Study findings and recommendations are described in Table 1.2.

Table 1.2: Findings & Recommendations

SECTION		FINDINGS
Vehicles	12 Mile Coulee Rd NW/Crowchild Tr	Anticipated to operate at capacity at the 2028 and 2039 horizons without site traffic. The 12 Mile Coulee/Crowchild Trail intersection is a regional issue, and a long-term solution is identified by the City of Calgary. Resolution of capacity constraints is beyond the scope of this TIA.
	12 Mile Coulee Rd NW/Blueridge Rise	Anticipated to operate with substantial delay for the east bound left turn. Although the analysis indicated no signal is warranted, local conditions may dictate a need for some improvement at some point in the future, but beyond the impact of this site. It is therefore recommended that the intersection be monitored by the County.
	12 Mile Coulee Rd NW/Tusslewood Dr	Anticipated to require signalization by the 2028 horizon without the site traffic. It continues to operate within capacity at the 2039 horizon and the post development horizons.
	12 Mile Coulee Rd NW/Tuscany Way	Anticipated to require signalization by the 2028 horizon without the site traffic. It continues to operate at capacity at the 2039 horizon and the post development horizons.
	12 Mile Coulee Rd NW/Damkar Court	It is capable of accommodating total post-development traffic through to the 2039 horizon. Thus, no improvements are required.
Active Modes	Sidewalks/Crossings	The proposed development includes a pathway along the utility right of way on the north boundary of the site. This will connect the regional pathway system in Watermark to the regional path (under construction) along 12 Mile Coulee Road. This then connects to a wider regional path system within Calgary. Signalization at the 12 Mile Coulee Road NW/Tuscany Way intersection with crosswalks, will improve the east-west connectivity and pedestrian safety.
	Cycling	There are no designated bike lanes in the communities surrounding the proposed development. However cycling infrastructure is provided through the regional path system.
	Transit	Transit is available within 650 metres of the site in the adjacent Tuscany area.

2. INTRODUCTION

2.1 Scope of Work

Based on discussions with the Rocky View County (**Appendix A**), the scope of work for this study was confirmed to include the following:

Development Trip Generation

- *Trip Generation* – Calculate development trips for vehicles during the weekday AM & PM peak hours based on Institute of Transportation Engineers' (ITE) Trip Generation Manual.
- *Trip Assignment* – Assign development trips to the network based on existing traffic patterns and expected draw.

Traffic

- *Horizons* – Review traffic conditions for:
  - Background (2028)
  - Background (2039)
  - After Development (2028) - Full Build Out
  - After Development (2039)
- *Intersection Capacity* – Complete weekday peak hour analysis at:
  - 12 Mile Coulee Road NW & Crowchild Trail
  - 12 Mile Coulee Road NW & Blueridge Rise
  - 12 Mile Coulee Road NW & Tusslewood Drive
  - 12 Mile Coulee Road NW & Tuscany Way
  - 12 Mile Coulee Road NW & Damkar Court
- *Recommendations* – Identify any mitigation measures required along 12 Mile Coulee Road NW.

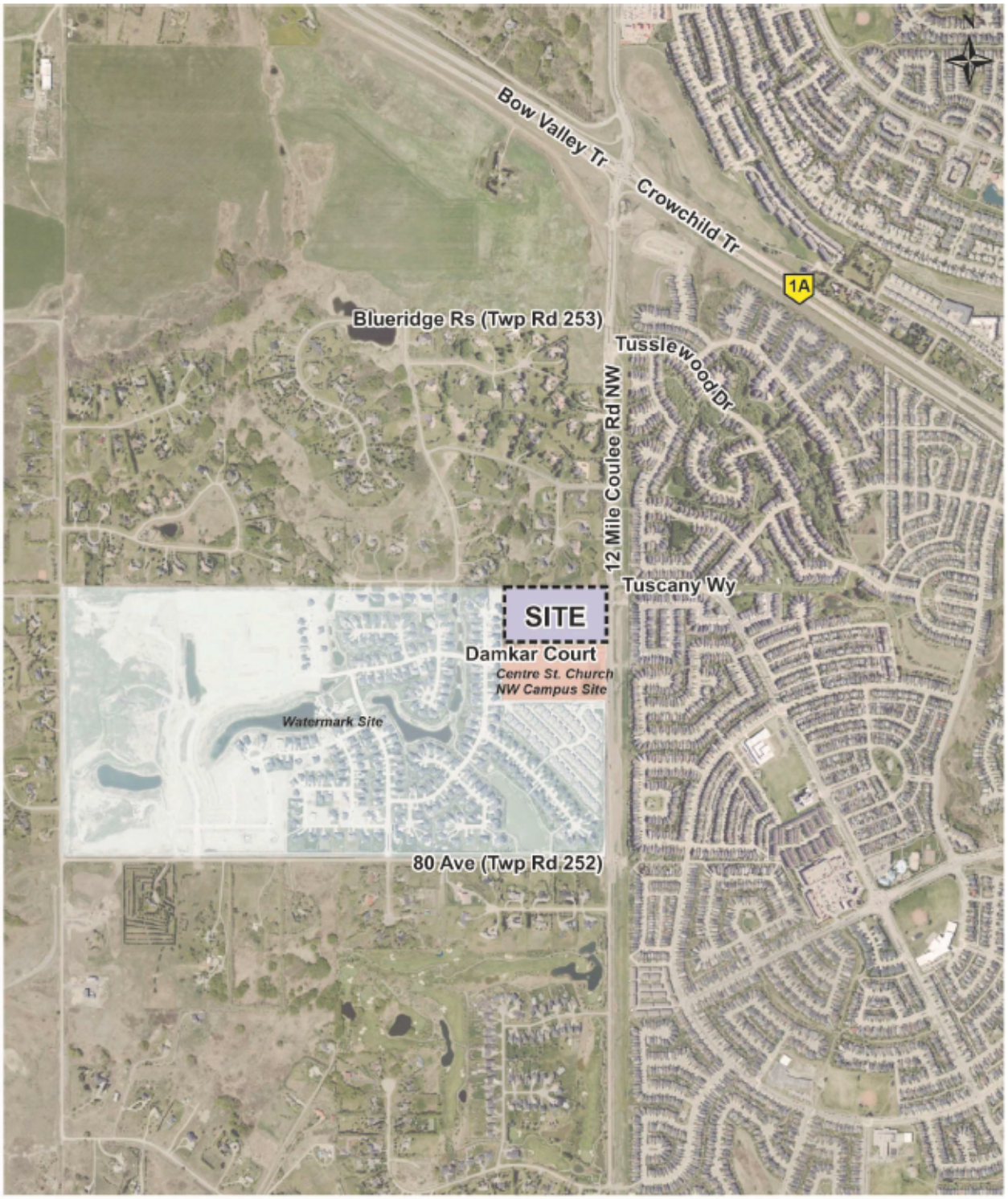
Active Modes

- Review active modes and connectivity to the site.

2.2 Site Context

The site is located in the north of the *Watermark at Bearspaw* residential subdivision and is bounded by a number of existing single detached houses to the north, 12 Mile Coulee Road NW to the east, *Centre Street Church Northwest Campus Site* to the south, and Spyglass Way to the west, as illustrated in **Figure 2.1**. The traffic volumes generated by *Centre Street Church Northwest Campus Site* and *Watermark Site 1* were included as background traffic in this study.

Figure 2.1: Site Context



Base Map Source: The City of Calgary

3. DEVELOPMENT

The site plan is illustrated in Figure 3.1.

Figure 3.1: Site Plan

3.1 Densities

Proposed development uses, phasing, and densities are summarized in **Table 3.1**.

Table 3.1: Proposed Densities

LAND USE	DENSITY
Senior Adult (55+) Housing - Attached	286 units
Congregate Care Facility	114 units

The latest site plan indicates 237 Senior Adult Housing units rather than the 286 units from an earlier plan that had been used for the analysis. As the analysis based on the 286 units produces more trips than the current 237 unit plan, the analysis was not updated as the results are conservative.

The Congregate Care Facility of 114 units is the same in the both site plans.

3.2 Trip Generation

The approved trip generation rates used in this analysis are summarized in **Table 3.2**. The trip generation rates are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual (10th Edition)*.

Table 3.2: Trip Generation Rates

USE	AM PEAK HOUR			PM PEAK HOUR			DATA SOURCE
	Trip Rate	In	Out	Trip Rate	In	Out	
Adult 55+ Housing-Attached	0.20 per unit	35%	65%	0.26 per unit	55%	45%	ITE 252
Congregate Care Facility	0.07 per unit	60%	40%	0.18 per unit	53%	47%	ITE 253

The expected development generated trips are summarized in **Table 3.3**.

Table 3.3: Vehicle Trip Generation

USE	DENSITY	AM PEAK HOUR			PM PEAK HOUR		
		Total	In	Out	Total	In	Out
Adult (55+) Housing-Attached	286 units	57	20	37	74	41	33
Congregate Care Facility	114 units	8	5	3	21	11	10
	TOTAL	65	25	40	95	52	43

It is noted that there are some commercial uses included with the Congregate Care Facility. However, these commercial uses are primarily for the on-site residents. Any external trips related to these uses would already be incorporated within anticipated visitor trips for the residential uses. Therefore, no additional trips generated by the commercial uses were included in the site traffic.

3.3 Trip Distribution

Vehicle trips were distributed based on a combination of previous approved Watermark TIA and Damkar Church TIA distribution. Existing traffic patterns were also used to assume the future traffic distribution. The trip distribution used in this study is illustrated in **Exhibit 3.1**.

3.4 Access

An all-turn access via Damkar Court to the site will be provided from 12 Mile Coulee Road NW approximately 200 metres south of the intersection of Tuscany Way NW. Vehicle trips from housings under Phase 1 & Phase 2, Phase 3 and Phase 4 are assigned to west access, middle access and east access, respectively. Pedestrian access to the development will be provided from Damkar Court.

The resulting development generated traffic volumes are illustrated in **Exhibit 3.2**.

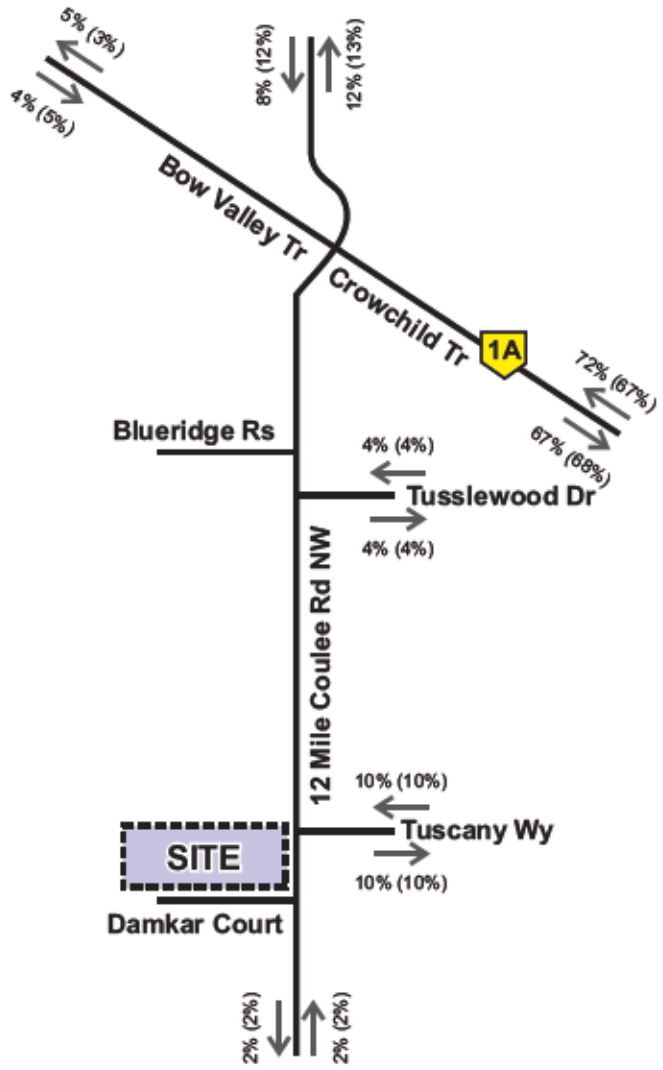


Exhibit 3.1

Site Traffic Distribution

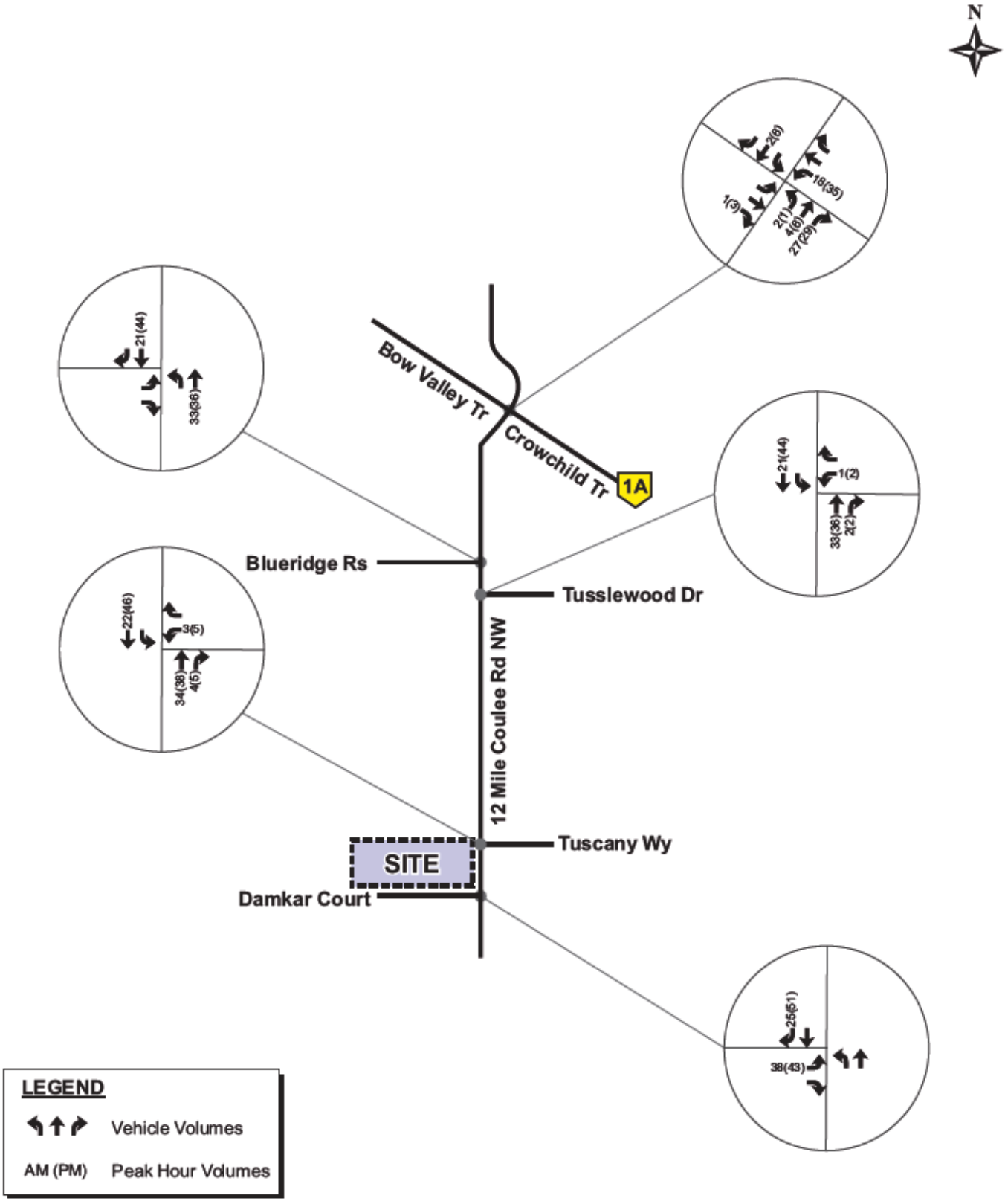


Exhibit 3.2

Site Traffic Volumes

4. TRAFFIC CONDITIONS

4.1 Road Network

The characteristics of roadways near the site are summarized in **Table 4.1**.

Table 4.1: Existing Roadway Characteristics

ROADWAY	CLASS.	CROSS-SECTION		POSTED SPEED	FACILITIES		
		# Lanes	Median		Parking	Bike Lanes	Bus Stops
Crowchild Tr (Highway 1A)	Skeletal	4	Yes	80-90 km/h	No	No	No
12 Mile Coulee Rd NW	Arterial	4	Yes	60 km/h	No	No	No
Tusslewood Dr	Collector	2	No	50 km/h	Yes	No	Yes
Tuscany Way*	Primary Collector	4	Yes	50 km/h	No	No	Yes
Blueridge Rise	Residential	2	No	50 km/h	No	No	No
Damkar Court	Collector	2	No	50 km/h	Yes	No	No

* The current Tuscany Way NW is not yet constructed to the final cross section. However, it is expected that it will be constructed by 2028.

4.2 Intersections

Existing intersection configurations and controls at study intersections are illustrated in **Exhibit 4.1.** A signal timing plan is included in **Appendix B**.

4.3 Volumes

4.3.1 Existing

Traffic counts were collected and used to request 2028/2039 Forecast to the City of Calgary. Traffic count data is summarized in **Table 4.2** and included in **Appendix C**.

Table 4.2: Data Collection Summary

INTERSECTION	COUNT DATE	DAY OF WEEK	SOURCE
12 Mile Coulee Road NW & Crowchild Trail	2020/02/05	Wednesday	Bunt & Associates
12 Mile Coulee Road NW & Blueridge Rise			
12 Mile Coulee Road NW & Tusslewood Dr			
12 Mile Coulee Road NW & Tuscany Way			

4.3.2 Background

Background traffic volumes for 2028 and 2039 horizon were created based on City of Calgary 2028/2039 Forecast (Appendix C) plus full build out of *Centre Street Church Northwest Campus Site* and one-third build out of *Watermark Site 1*.

Background traffic volumes are illustrated in **Exhibit 4.2** (2028 horizon) and **Exhibit 4.3** (2039 horizon).

4.3.3 After Development

Development generated traffic volumes (Exhibit 3.2) were added to Background traffic volumes to forecast the After Development traffic volumes illustrated in Exhibit 4.4 (2028 horizon – full build out) and Exhibit 4.5 (2039 horizon).

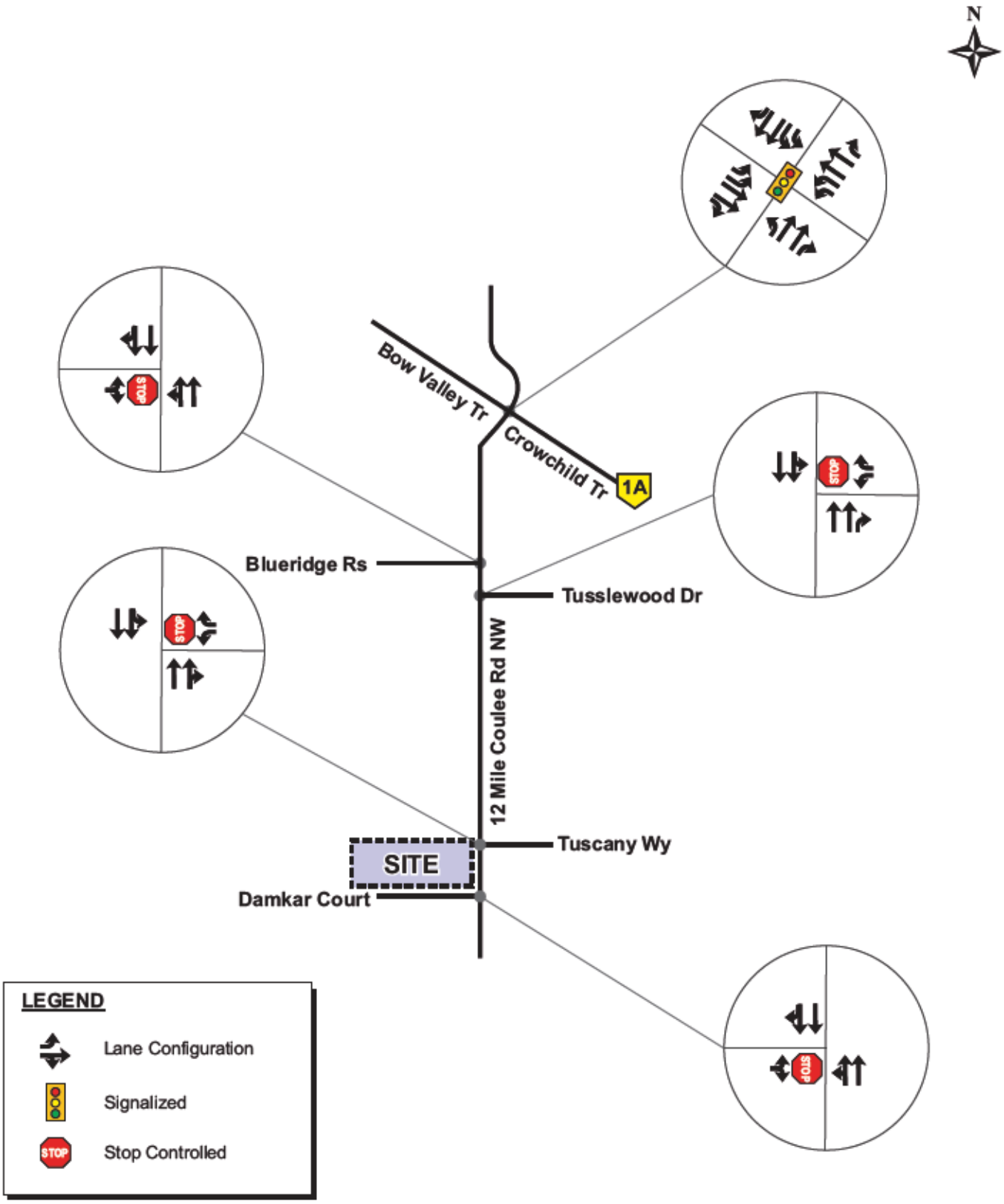


Exhibit 4.1

Background / After Development Intersection Configurations

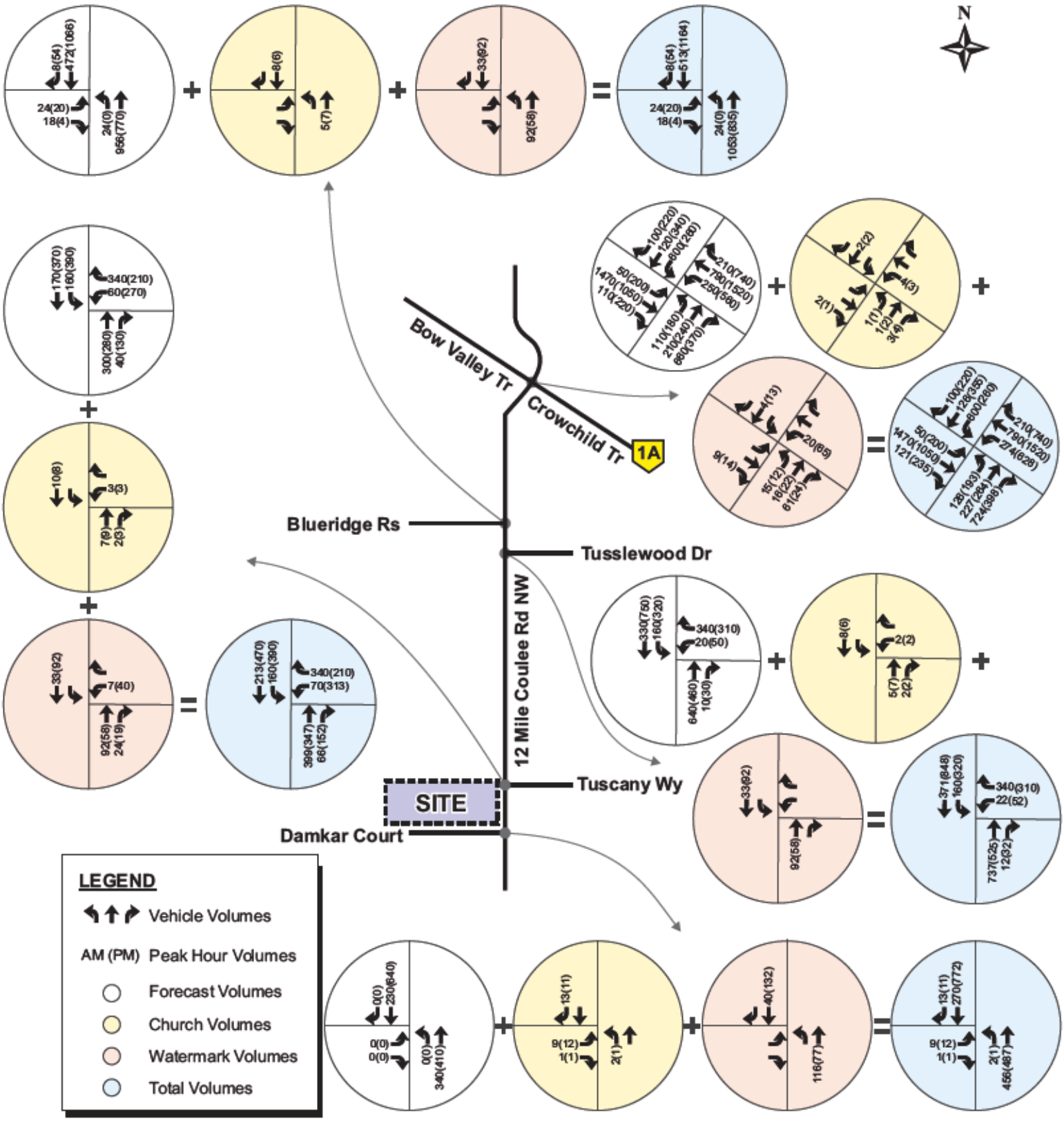


Exhibit 4.2

Background (2028) Traffic Volumes

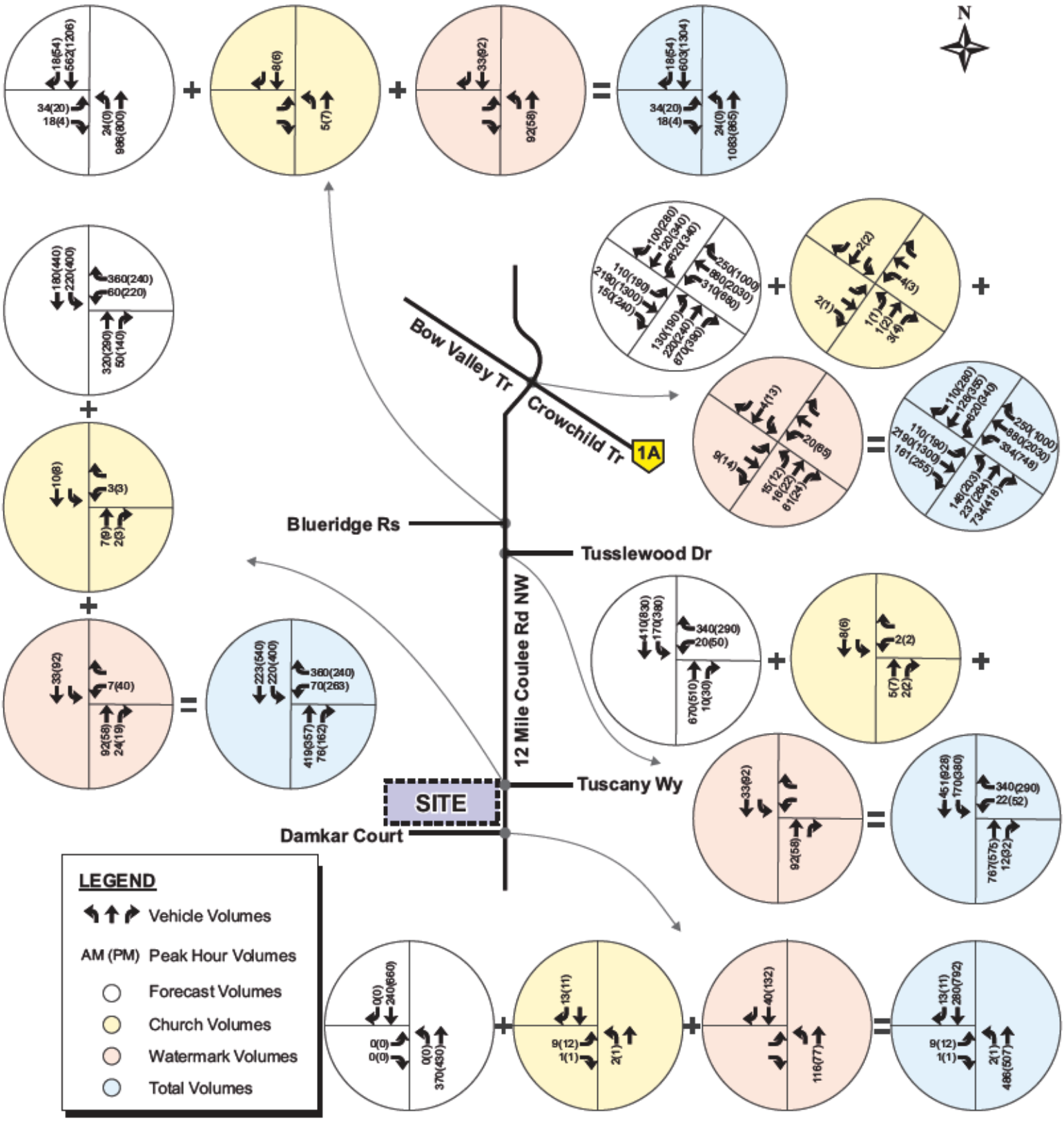


Exhibit 4.3

Background (2039) Traffic Volumes

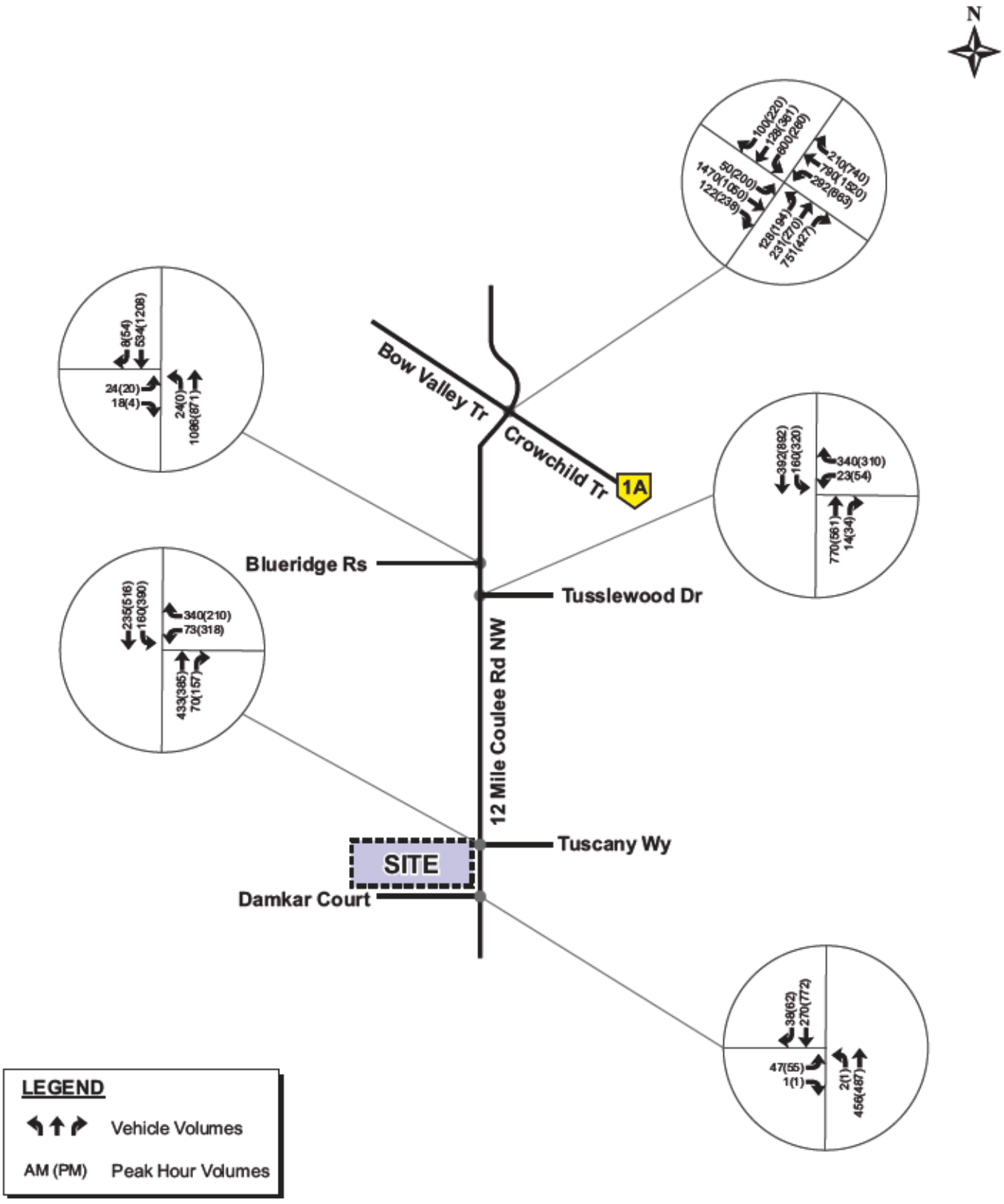


Exhibit 4.4

After Development (2028 - Full Build Out) Traffic Volumes

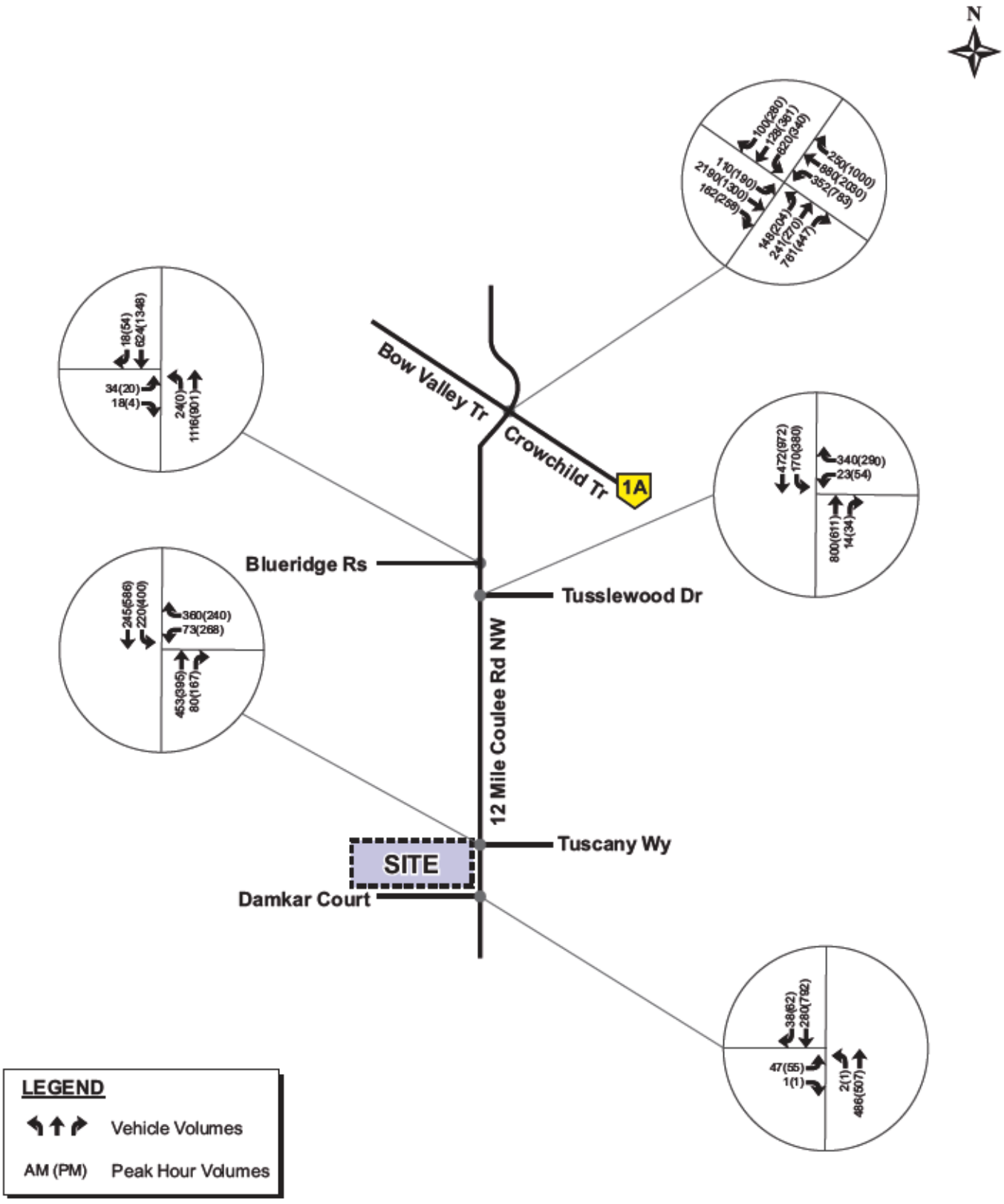


Exhibit 4.5

After Development (2039) Traffic Volumes

4.4 Intersection Analysis

Synchro 9.2 traffic analysis software was used to review intersection operational conditions based on the methods outlined in the Highway Capacity Manual. Traffic operations were assessed using the performance measures of volume-to-capacity (v/c) and Level of Service (LOS).

The volume-to-capacity (v/c) ratio of an intersection movement represents the ratio between the demand volume and available capacity. A v/c ratio over 1.0 indicates a congested intersection where drivers may have to wait through more than one signal cycle. The Level of Service (LOS) rating is based on average vehicle delays ranging from LOS A (minimal delay) to LOS F (significant delay).

Intersection capacity analysis was completed for the following scenarios:

- Background (2028 Horizon)
- Background (2039 Horizon)
- After Development (2028 Horizon) – Full Build Out
- After Development (2039 Horizon)

The analysis is completed as per City of Calgary TIA guidelines with a saturation flow rate of 1850 vehicles per hour and a peak hour factor of 0.94 (AM) and 0.95 (PM). The analysis uses a minimum hourly volume of 5 vehicles per movement, 10 pedestrians per crossing, and 5 cyclists per leg. For the existing scenario, heavy vehicle percentages were applied from the existing counts.

The analysis is completed as per City of Calgary TIA guidelines with a saturation flow rate of 1850 vehicles per hour and a peak hour factor of 0.94 (AM) and 0.95 (PM). The analysis uses a minimum hourly volume of 5 vehicles per movement, 10 pedestrians per crossing, and 5 cyclists per leg. For the existing scenario, heavy vehicle percentages were applied from the existing counts.

The volume to capacity (v/c) ratio, level of service, average control delay (in seconds), and 95th percentile queue (in metres) are summarized in this report. Synchro output reports are provided in **Appendix D**.

4.4.1 Background Analysis

Background (2028)

Background (2028) intersection analysis is summarized in **Table 4.3** based on the intersection configurations illustrated in Exhibit 4.1 and volumes illustrated in Exhibit 4.2.

Table 4.3: Background (2028) Intersection Analysis

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR v/c	AM LOS	AM Delay	AM Queue	PM PEAK HOUR v/c	PM LOS	PM Delay	PM Queue
12 Mile Coulee Rd NW & Crowchild Tr *(Signalized)*	EBL	2	0.25	E	63	16	0.59	D	55	43
	EBT	2	1.42	F	227	427	1.17	F	123	261
	EBR	1	0.22	A	4	10	0.42	A	7	23
	WBL	2	0.80	E	72	76	0.98	E	75	154
	WBT	2	0.64	D	37	160	1.25	F	152	385
	WBR	1	0.32	A	6	21	1.01	D	55	263
	NBL	1	0.98	F	129	97	1.28	F	210	131
	NBT	2	0.50	D	53	44	0.49	D	44	43
	NBR	1	0.51	A	1	<5	0.28	A	1	<5
	SBL	2	0.89	E	64	146	0.69	E	57	54
	SBT	2	0.14	C	33	21	0.57	D	42	54
	SBR	1	0.07	A	0	<5	0.15	A	0	<5
	Overall		-	*F*	*95.1*	-	-	*F*	*89.4*	-
12 Mile Coulee Rd NW & Blueridge Rs *(EB Stop)*	EBLR	1	0.18	C	22	5	0.28	F	59	8
	NBLT	1	0.03	A	1	<5	<0.02	A	0	<5
	NBT	1	0.44	A	0	<5	0.34	A	0	<5
	SBT	1	0.21	A	0	<5	0.48	A	0	<5
	SBTR	1	0.11	A	0	<5	0.27	A	0	<5
	Overall		-	*A*	*0.8*	-	-	*A*	*0.7*	-
12 Mile Coulee Rd NW & Tusslewood Dr *(WB Stop)*	WBL	1	0.21	E	45	6	1.01	F	246	37
	WBLR	1	0.62	C	21	35	0.47	B	15	20
	NBT	2	0.23	A	0	<5	0.16	A	0	<5
	NBR	1	<0.02	A	0	<5	0.02	A	0	<5
	SBLT	1	0.21	A	7	6	0.34	A	8	12
	SBT	1	0.15	A	0	<5	0.35	A	0	<5
	Overall		-	*A*	*6.2*	-	-	*B*	*10.5*	-
12 Mile Coulee Rd NW & Tuscany Way *(WB Stop)*	WBL	1	0.34	D	30	11	>1.02	F	Err*	Err
	WBR	1	0.50	B	15	23	0.31	B	13	11
	NBT	1	0.17	A	0	<5	0.14	A	0	<5
	NBTR	1	0.12	A	0	<5	0.17	A	0	<5
	SBLT	1	0.16	A	7	<5	0.40	A	9	16
	SBT	1	0.09	A	0	<5	0.19	A	0	<5
	Overall		-	*B*	*7.0*	-	-	*F*	Err	-
12 Mile Coulee Rd NW & Damkar Court *(EB Stop)*	EBLR	1	0.03	B	12	<5	0.07	C	21	<5
	NBLT	1	<0.02	A	0	<5	<0.02	A	0	<5
	NBT	1	0.19	A	0	<5	0.20	A	0	<5
	SBT	1	0.11	A	0	<5	0.32	A	0	<5
	SBTR	1	0.06	A	0	<5	0.17	A	0	<5
	Overall		-	*A*	*0.3*	-	-	*A*	*0.3*	-

* Forecast volumes greatly exceed capacity based on Synchro 9.2 signalized intersection capacity analysis methodology yielding the error results.

Intersection capacity analysis indicates that the four of the five study intersections are expected to reach or operate at capacity. These are described below.

The 12 Mile Coulee Road NW/Crowchild Trail intersection is anticipated to operate at capacity. While additional through lanes on Crowchild Trail can be added, this is not included in future funded projects of either AT, RVC or the City of Calgary. These improvements are regional in nature and not directly attributable to this development. Upgrading to a grade separated interchange will ultimately be required

but was not assumed to be in place at this horizon year. It is noted that there is no current timeline as to when the interchange will be built, however previous development in the area (i.e., Watermark at Bearspaw) has been approved on the basis that this interchange will be in place in the long-range horizon. No improvements were therefore identified at this horizon for this intersection as part of this analysis.

The eastbound (EB) movements at the 12 Mile Coulee Road NW/Blueridge Rise intersection are expected to operate at LOS F due to the delay greater than 50 seconds. A signal warrant resulted in a score of 22. Typically, a score of this level would not warrant the installation of a signal. However, local conditions may dictate a need for some improvement at some point in the future, but beyond the impact of this site. It is therefore recommended that the intersection be monitored by the County.

The 12 Mile Coulee Road NW/Tusslewood Dr intersection is anticipated to operate at capacity as a stop-controlled intersection. The intersection warrants a signal with a score of 155. The intersection was analyzed as a signalized intersection. The results are summarized in **Table 4.4.**

The 12 Mile Coulee Road NW/Tuscany Way expected to operate at capacity as a stop-controlled intersection. The intersection has a signal warrant score of 165.

The intersections were analyzed as signalized intersections. The results are summarized in **Table 4.4.**

Table 4.4: Background (2028) Intersection Analysis - Improved

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR				PM PEAK HOUR			
			v/c	LOS	Delay	Queue	v/c	LOS	Delay	Queue
12 Mile Coulee Rd NW & Tusslewood Dr *(Signalized)*	WBL	1	0.04	B	12	6	0.16	C	23	14
	WBR	1	0.68	B	17	48	0.63	B	11	25
	NBT	2	0.49	B	11	51	0.25	A	6	33
	NBR	1	0.02	A	6	<3	0.04	A	3	<5
	SBLT	1	0.60	B	14	44	0.82	B	17	146
	SBT	1	0.60	B	14	44	0.82	B	17	146
	Overall		-	*B*	*13.1*	-	-	*B*	*13.1*	-
12 Mile Coulee Rd NW & Tuscany Way *(Signalized)*	WBL	1	0.15	B	12	10	0.66	C	24	54
	WBR	1	0.58	A	8	19	0.37	A	5	12
	NBT	1	0.31	A	8	26	0.31	A	6	20
	NBTR	1	0.31	A	8	26	0.31	A	6	20
	SBLT	1	0.38	A	10	25	0.99	B	20	81
	SBT	1	0.38	A	10	25	0.99	B	20	81
	Overall		-	*A*	*8.5*	-	-	*B*	*15.2*	-

The 12 Mile Coulee Rd NW/Tuscany Way intersection is expected to essentially operate at capacity. This is due to a substantial increase in the volumes using this intersection specifically for movements to and from the south of the intersection. This increase in volume could be attributed to the development of the Haskayne ASP lands. It is recommended that this intersection is monitored as these lands develop to determine if the increase in traffic volumes actually eventuates.

If the 12 Mile Coulee Road NW/Tusslewood Dr intersection was signalized, it is anticipated to operate within capacity. The south bound queue of 146 metres exceeds the storage length of 60 metres and is

long enough to block the intersection of 12 Mile Coulee Road NW/Blueridge Rise. This can be mitigated through the installation of appropriate signage.

Background (2039)

Background (2039) intersection analysis is summarized in Table 4.5 based on the intersection configurations illustrated in Exhibit 4.1 and volumes illustrated in Exhibit 4.3.

Table 4.5: Background (2039) Intersection Analysis

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR v/c	AM LOS	AM Delay	AM Queue	PM PEAK HOUR v/c	PM LOS	PM Delay	PM Queue
12 Mile Coulee Rd NW & Crowchild Tr *(Signalized)*	EBL	2	0.45	E	63	29	0.58	E	55	41
	EBT	2	2.15	F	544	686	1.47	F	249	343
	EBR	1	0.30	A	9	24	0.45	A	7	24
	WBL	2	0.93	F	87	100	1.18	F	134	192
	WBT	2	0.79	D	44	211	1.68	F	336	545
	WBR	1	0.39	A	6	23	1.36	F	191	425
	NBL	1	1.15	F	173	113	1.37	F	240	138
	NBT	2	0.52	D	54	46	0.51	D	45	43
	NBR	1	0.52	A	1	<5	0.29	A	1	<5
	SBL	2	0.91	E	67	153	0.82	E	63	83
	SBT	2	0.14	C	33	21	0.55	D	42	54
	SBR	1	0.07	A	0	<5	0.20	A	0	<5
	Overall		-	*F*	*229.6*	-	-	*F*	*190.5*	-
12 Mile Coulee Rd NW & Blueridge Rs *(EB Stop)*	EBLR	1	0.21	C	22	6	0.34	F	76	10
	NBLT	1	0.03	A	1	<5	<0.02	A	0	<5
	NBT	1	0.45	A	0	<5	0.36	A	0	<5
	SBT	1	0.25	A	0	<5	0.54	A	0	<5
	SBTR	1	0.14	A	0	<5	0.30	A	0	<5
	Overall		-	*A*	*0.8*	-	-	*A*	*0.9*	-
12 Mile Coulee Rd NW & Tusslewood Dr *(Signalized)*	WBL	1	0.04	B	12	6	0.17	C	23	14
	WBR	1	0.68	B	18	49	0.63	B	12	26
	NBT	2	0.51	B	11	53	0.27	A	6	36
	NBR	1	0.02	A	6	<5	0.33	A	3	<5
	SBLT	1	0.70	B	16	55	0.94	C	26	176
	SBT	1	0.70	B	16	55	0.94	C	26	176
	Overall		-	*B*	*14.4*	-	-	*B*	*18.8*	-
12 Mile Coulee Rd NW & Tuscany Way *(Signalized)*	WBLR	1	0.15	B	12	11	0.60	C	23	45
	WBR	1	0.61	A	9	23	0.43	A	5	13
	NBT	1	0.33	A	8	27	0.31	A	5	20
	NBTR	1	0.33	A	8	27	0.31	A	5	20
	SBLT	1	0.46	B	10	31	0.99	C	22	93
	SBT	1	0.46	B	10	31	0.99	C	22	93
	Overall		-	*1*	*9.0*	-	-	*B*	*15.5*	-
12 Mile Coulee Rd NW & Damkar Court *(EB Stop)*	EBLR	1	0.03	B	12	<5	0.08	C	22	<5
	NBLT	1	<0.02	A	0	<5	<0.02	A	0	<5
	NBT	1	0.20	A	0	<5	0.21	A	0	<5
	SBT	1	0.12	A	0	<5	0.33	A	0	<5
	SBTR	1	0.07	A	0	<5	0.17	A	0	<5
	Overall		-	*A*	*0.3*	-	-	*A*	*0.3*	-

As mentioned earlier, the intersection of 12 Mile Coulee Road NW/Crowchild Trail is expected to operate at capacity as upgrading this intersection to an interchange is beyond the scope of this TIA and this project.

A signal warrant for the 12 Mile Coulee Road NW/Blueridge Rise intersection resulted in a score of 27. No further action is required for this intersection for the Background 2039 horizon.

4.4.2 After Development Analysis

After Development (2028) – Full Built Out

The After Development (2028) reflects the anticipated year when the development will be fully built. The intersection analysis is summarized in **Table 4.6** based on the intersection configurations for the improved Background (2028) scenario and volumes illustrated in Exhibit 4.4.

Table 4.6: After Development (2028) Intersection Analysis

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR v/c	AM LOS	AM Delay	AM Queue	PM PEAK HOUR v/c	PM LOS	PM Delay	PM Queue
12 Mile Coulee Rd NW & Crowchild Tr *(Signalized)*	EBL	2	0.25	E	63	16	0.59	E	55	43
	EBT	2	1.42	F	229	427	1.17	F	123	261
	EBR	1	0.22	A	4	11	0.42	A	7	32
	WBL	2	0.84	E	75	84	1.04	F	88	165
	WBT	2	0.64	D	37	160	1.26	F	153	385
	WBR	1	0.32	A	6	21	1.01	E	56	263
	NBL	1	0.99	F	134	98	1.30	F	213	131
	NBT	2	0.51	D	53	45	0.50	D	44	44
	NBR	1	0.53	A	1	<5	0.30	A	1	<5
	SBL	2	0.89	E	64	146	0.69	E	57	54
	SBT	2	0.14	C	33	22	0.57	D	42	54
	SBR	1	0.07	A	0	<5	0.15	A	0	<5
	Overall		-	*F*	*95.6*	-	-	*F*	*90.8*	-
12 Mile Coulee Rd NW & Blueridge Rs *(EB Stop)*	EBLR	1	0.14	C	18	<5	0.29	F	62	9
	NBLT	1	0.03	A	1	<5	<0.02	A	0	<5
	NBT	1	0.45	A	0	<5	0.36	A	0	<5
	SBT	1	0.22	A	0	<5	0.50	A	0	<5
	SBTR	1	0.12	A	0	<5	0.28	A	0	<5
	Overall		-	*A*	*0.6*	-	-	*A*	*0.7*	-
12 Mile Coulee Rd NW & Tusslewood Dr *(Signalized)*	WBL	1	0.04	B	12	6	0.17	C	23	15
	WBR	1	0.68	B	18	49	0.66	B	13	29
	NBT	2	0.51	B	11	53	0.26	A	6	35
	NBR	1	0.02	A	7	<5	0.04	A	3	<5
	SBLT	1	0.63	B	15	47	0.85	B	18	155
	SBT	1	0.63	B	15	47	0.85	B	18	155
	Overall		-	*B*	*13.6*	-	-	*B*	*14.2*	-
12 Mile Coulee Rd NW & Tuscany Way *(Signalized)*	WBL	1	0.16	B	12	11	0.68	C	25	55
	WBR	1	0.60	A	9	22	0.38	A	5	12
	NBT	1	0.34	A	8	29	0.33	A	6	22
	NBTR	1	0.34	A	8	29	0.33	A	6	22
	SBLT	1	0.41	B	10	27	1.02	C	23	89
	SBT	1	0.41	B	10	27	1.02	C	23	89
	Overall		-	*A*	*9.1*	-	-	*B*	*16.6*	-
12 Mile Coulee Rd NW & Damkar Court *(EB Stop)*	EBLR	1	0.12	B	14	<5	0.31	D	31	10
	NBLT	1	<0.02	A	0	<5	<0.02	A	0	<5
	NBT	1	0.19	A	0	<5	0.20	A	0	<5
	SBT	1	0.11	A	0	<5	0.32	A	0	<5
	SBTR	1	0.08	A	0	<5	0.20	A	0	<5
	Overall		-	*A*	*0.9*	-	-	*A*	*1.4*	-

The After Development 2028 analysis indicates that most of the study intersections are anticipated to operate at capacity as it was in the Background 2028 conditions. The site traffic causes negligible impacts to the intersections and movements. A signal warrant for the 12 Mile Coulee Road NW/Blueridge Rise intersection resulted in a score of 22.

As noted for the 2028 background horizon, the 12 Mile Coulee Road / Tuscany Way intersection is essentially operating at capacity as a signalized intersection. This is likely attributable to the development of the Haskayne ASP lands and as such this intersection should be monitored as those lands develop.

Therefore, no additional improvements beyond those identified for the background scenarios are recommended.

After Development (2039)

After Development (2039) intersection analysis is summarized in Table 4.7 based on the intersection configurations for the Background (2039) scenario and volumes illustrated in Exhibit 4.5.

Table 4.7: After Development (2039) Intersection Analysis

INTERSECTION	MOVEMENT & LANES		AM PEAK HOUR v/c	AM LOS	AM Delay	AM Queue	PM PEAK HOUR v/c	PM LOS	PM Delay	PM Queue
12 Mile Coulee Rd NW & Crowchild Tr *(Signalized)*	EBL	2	0.44	E	63	29	0.58	E	55	41
	EBT	2	2.15	F	544	686	1.46	F	243	342
	EBR	1	0.30	A	9	24	0.45	A	7	34
	WBL	2	0.99	F	99	107	1.24	F	156	204
	WBT	2	0.80	D	44	212	1.68	F	337	545
	WBR	1	0.39	A	6	23	1.36	F	193	426
	NBL	1	1.16	F	178	115	1.38	F	244	139
	NBT	2	0.53	D	54	47	0.52	D	45	44
	NBR	1	0.54	A	1	<5	0.31	A	1	<5
	SBL	2	0.91	E	67	153	0.82	E	64	83
	SBT	2	0.14	C	33	22	0.56	D	42	54
	SBR	1	0.07	A	0	<5	0.20	A	0	<5
	Overall		-	*F*	*229.2*	-	-	*F*	*187.9*	-
12 Mile Coulee Rd NW & Blueridge Rs *(EB Stop)*	EBLR	1	0.22	C	24	7	0.38	F	86	12
	NBLT	1	0.03	A	1	<5	<0.02	A	0	<5
	NBT	1	0.47	A	0	<5	0.37	A	0	<5
	SBT	1	0.26	A	0	<5	0.56	A	0	<5
	SBTR	1	0.14	A	0	<5	0.31	A	0	<5
	Overall		-	*A*	*0.9*	-	-	*A*	*1.0*	-
12 Mile Coulee Rd NW & Tusslewood Dr *(Signalized)*	WBL	1	0.04	B	13	6	0.17	C	23	15
	WBR	1	0.69	B	19	51	0.64	B	14	30
	NBT	2	0.52	B	11	56	0.29	A	6	39
	NBR	1	0.02	A	6	<5	0.04	A	3	<5
	SBLT	1	0.73	B	18	62	0.98	C	35	186
	SBT	1	0.73	B	18	62	0.98	C	35	186
	Overall		-	*B*	*15.1*	-	-	*C*	*24.1*	-
12 Mile Coulee Rd NW & Tuscany Way *(Signalized)*	WBL	1	0.16	B	12	12	0.64	C	25	46
	WBR	1	0.63	B	10	27	0.44	A	5	13
	NBT	1	0.35	A	8	30	0.32	A	6	23
	NBTR	1	0.35	A	8	30	0.32	A	6	23
	SBLT	1	0.49	B	11	33	1.00	C	23	101
	SBT	1	0.49	B	11	33	1.00	C	23	101
	Overall		-	*A*	*9.5*	-	-	*B*	*16.6*	-
12 Mile Coulee Rd NW & Damkar Court *(EB Stop)*	EBLR	1	0.13	B	14	<5	0.33	D	32	11
	NBLT	1	<0.02	A	0	<5	<0.02	A	0	<5
	NBT	1	0.20	A	0	<5	0.21	A	0	<5
	SBT	1	0.12	A	0	<5	0.33	A	0	<5
	SBTR	1	0.08	A	0	<5	0.20	A	0	<5
	Overall		-	*A*	*0.9*	-	-	*A*	*1.4*	-

The After Development 2039 analysis indicates that most of the study intersections are anticipated to operate at capacity as it was in the Background 2039 conditions. The site traffic causes negligible impacts to the intersections and movements. A signal warrant for the 12 Mile Coulee Road NW/Blueridge Rise intersection resulted in a score of 28.

Therefore, no additional improvements beyond those identified for the background scenarios are recommended.

4.4.3 Conclusion

This analysis outlined in this report shows that the 12 Mile Coulee Road NW/Damkar Court intersection is capable of accommodating traffic through to 2039 horizon with consideration of site traffic while the other four intersections are anticipated to operate at capacity by 2028 horizon without adding the site traffic. The 12 Mile Coulee/Crowchild Trail intersection is a regional issue, and a long-term solution is identified by the City of Calgary, however it is beyond the scope of the TIA and this project.

The signal warrant at the 12 Mile Coulee Road NW/Blueridge Rise intersection resulted in 28 or less for each horizon. Thus, no further action is required for this intersection.

The 12 Mile Coulee Road NW/Tusslewood Dr intersection is anticipated to operate at capacity as a stop-control intersection by 2028 horizon without the site traffic. Therefore, it is recommended that the intersection is signalized for the background scenario.

The 12 Mile Coulee Road NW/Tuscany Way is also expected to operate at capacity as a stop-controlled at the 2028 horizon without site traffic. If the intersection is signalized, the south bound movements are expected to essentially operate at capacity in all horizons. It is likely that the increase in traffic volumes is attributable to the full build out of the Haskayne ASP lands. As such, it is recommended that this intersection is monitored as these areas develop and signalized at the appropriate time should the increase in volumes eventuate.

It is noted that this development causes negligible impacts to the intersections and movements of the four study intersections and movements at capacity. Therefore, no additional improvements beyond those identified for the background scenarios are recommended.

4.5 Signal Warrant Analysis

Signal warrant analysis was completed for the intersections listed in **Table 4.8** based on the methods outlined in the Transportation Association of Canada (TAC) *Traffic Signal and Pedestrian Signal Head Warrant Handbook* (2014). Under TAC methodology, a score of 100 points or more indicates a traffic signal is warranted. The signal warrant analysis is summarized in Table 4.8 and included in **Appendix E**.

Table 4.8: Signal Warrant Analysis

INTERSECTION	HORIZON	SIGNAL WARRANT SCORE			COMMENT
		Total	Vehicle	Pedestrian	
12 Mile Coulee Rd NW & Blueridge Rise	Background 2028	21/100	22	0	Not warranted
	Background 2039	27/100	27	0	
	After Development 2028	22/100	22	0	
	After Development 2039	28/100	28	0	
12 Mile Coulee Rd NW & Tusslewood Dr	Background 2028	155/100	155	0	Warranted
12 Mile Coulee Rd NW & Tuscany Way	Background 2028	165/100	165	0	Warranted

Signal warrant analysis confirms that a traffic signal is not warranted at the 12 Mile Coulee Road NW/Blueridge Rise intersection. Signals are required at 12 Mile Coulee Road NW/Tusslewood Drive NW and 12 Mile Coulee Road NW/Tuscany Way intersections. However, as mentioned above, signalization is not recommended at the 12 Mile Coulee Road NW/Tusslewood Dr intersection due to other anticipated improvements as a result of other development in this area.

4.6 Daily Volumes

To review roadway classifications and capacities, daily vehicle traffic volumes were calculated and compared to City of Calgary environmental guidelines. Environmental guidelines represent the desired daily volume range for a roadway, whereas the actual physical capacity can be higher.

For comparison to guidelines, background and development daily volumes are calculated based on PM peak hour trip generation multiplied by a standard factor of 10.

The resulting daily volume analysis is summarized in **Table 4.9**.

Table 4.9: Daily Volume Analysis

ROADWAY	SECTION	CLASS.	DAILY VOLUMES				
			Guideline	Back 2028	Back 2039	After 2028	After 2039
12 Mile Coulee Rd NW	Crowchild Tr NW – Tuscany Way NW	Arterial	20,000 – 35,000	20,700	22,400	21,500	23,200
	South of Tuscany Way NW	Primary Collector	8,000 - 15,000	12,800	13,200	13,800	14,200
Tusslewood Dr	12 Mile Coulee Rd NW – Tuscany Springs Terrace NW	Collector	2,000 – 8,000	7,150	7,550	7,200	7,600
Tuscany Way*	12 Mile Coulee Rd NW – Tuscany Ridge Manor NW	Primary Collector	8,000- 15,000	10,700	10,700	10,800	10,800

* The current Tuscany Way NW is not yet constructed to the final cross section. However, it is expected to be constructed by 2028

The analysis confirms that all roadways will continue to carry traffic volumes within their respective guidelines after the addition of site traffic and therefore no adjustments to roadway classifications are required to accommodate the development.

5. ACTIVE MODES

The development is proposing 400 units consisting of 114 seniors care facilities and 286 residential units. This analysis is to ensure that there is adequate connectivity from the site to existing active mode network.

5.1 Walking & Cycling

A review of sidewalk facilities near the site is illustrated in Figure 5.1 and summarized in Table 5.1.

Figure 5.1: Active Mode Network

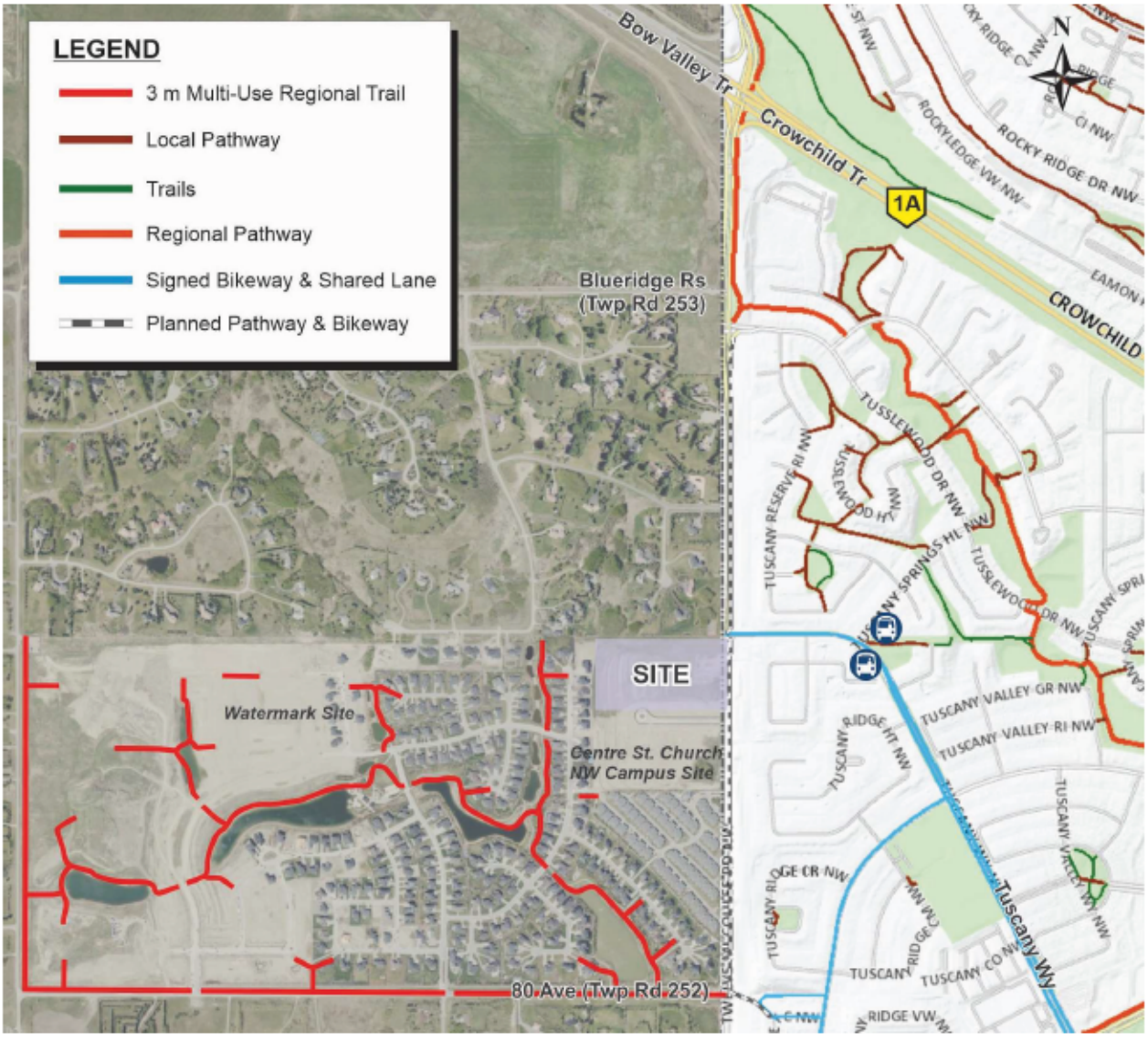


Table 5.1: Sidewalk Review

ROADWAY	TYPE	LOCATION	CONDITION	DEFICIENCY
12 Mile Coulee Rd NW (Crowchild Tr – Tusslewood Dr)	Regional Pathway	East Side	Good	None
12 Mile Coulee Rd NW (Tusslewood Dr – 80 Ave)	Regional Pathway	East Side	To Be Constructed	Unpaved
Tusslewood Dr	Sidewalk	Both Sides	Good	None
Tuscany Way	Sidewalk	North Side	Good	None
Damkar Court	Sidewalk	Both Sides	Good	None

Limited sidewalks currently exist near the site with the majority being in the adjacent Tuscany area. The Watermark at Bearspaw development is located to the south and west of the subject lands. There are regional paths located through this development, specially one that runs from Blueridge View to 80 Avenue. The proposed development includes a pathway that will be located along the northern boundary of the site within the Utility Right of Way (URW). This pathway will connect regional path in Watermark to the 12 Mile Coulee Road NW/Tuscany Way intersection, where there are sidewalks into the Tuscany community and the regional path (under construction) along the eastern side of 12 Mile Coulee Road NW. Currently, pedestrian crosswalks exist across the north and east approach at the intersection of 12 Mile Coulee / Crowchild Tr. Signalization at the 12 Mile Coulee Road NW/Tuscany Way intersection with crosswalks, as recommended for the 2028 horizon, will improve the east-west connectivity and pedestrian's safety. Although limited pedestrian infrastructure currently exists near the site, adequate pedestrian connections will be put in place with the development of the proposed site. **Figure 5.2 & Figure 5.3** illustrate sidewalks in the vicinity of the site.

Figure 5.2: 12 Mile Coulee Rd NW & Tuscany Wy To North (NW Side/NE Side/WN Side)

Figure 5.3: 12 Mile Coulee Rd NW & Damkar Court (NW Side/SW Side/WN Side)

Similar to the existing pedestrian infrastructure, the existing bicycle infrastructure is located within the adjacent Tuscany area. The Tuscany development has several Regional Pathways as well as an on-street bikeway along Tuscany Way. Additionally, the City of Calgary's Pathways and Bikeways Implementation Plan indicates a proposed pathway along 12 Mile Coulee Road NW from Tusslewood Drive to Bearspaw Dam Road NW.

Findings

The proposed site is in an area that is currently undergoing development; therefore limited pedestrian infrastructure currently exists near the site. However, adequate pedestrian connections and bicycle access will be provided with the development of the proposed site, thereby reducing the number of missing links in the immediate vicinity.

5.2 Transit

Transit services are provided within 650 metres walking distance of the site. Transit stop locations are summarized in **Table 5.2**. The existing area transit network is illustrated in **Figure 5.4** and summarized **Table 5.3**.

Table 5.2: Existing Transit Stops

STOP LOCATION			STOP #	ROUTES SERVICED	WALKING DISTANCE
Roadway	Cross-Street	Direction			
Tuscany Way	Tuscany Springs Hill	SB	3820	74	650 m
Tuscany Springs Hill	Tuscany Way	NB	3819	174	750 m

Figure 5.4: Existing Transit Service

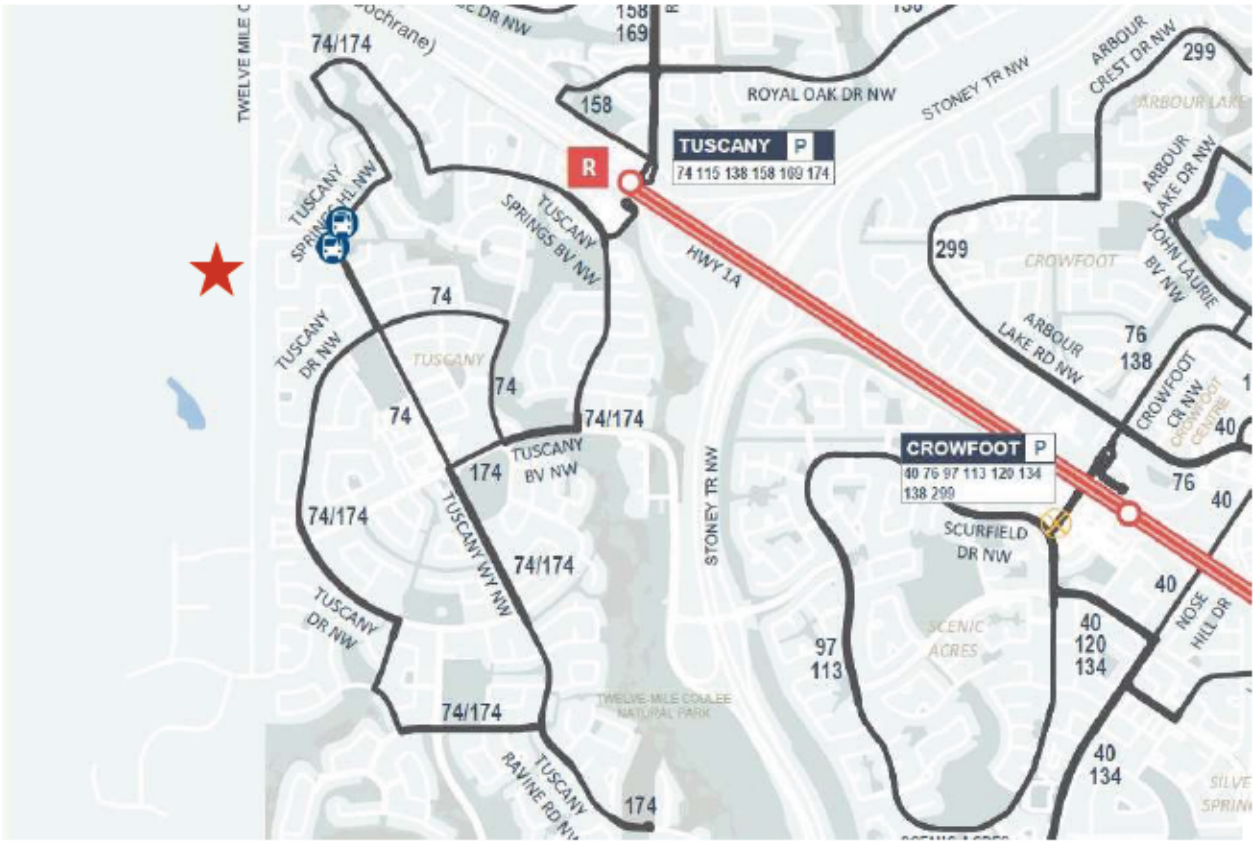


Table 5.3: Existing Transit Frequency

ROUTE		WEEKDAY SERVICE		HEADWAY (MINUTES)				
#	Direction	Start	End	AM	Mid-Day	PM	Even.	Sat.
74	Tuscany (Counterclockwise)	05:12	00:56	15	20	15	30	30
174	Tuscany (Clockwise)	05:09	07:01	15	30	15	30	-

Findings

Existing transit service provides frequent connections within Tuscany and to Tuscany LRT station.

APPENDIX A

Scope of Work

Soo Jin Ri

From: Jason Dunn
Sent: February 21, 2020 9:34 AM
To: Soo Jin Ri
Subject: FW: Damkar Seniors TIA

Soo Jin,

Accepted scope from RVC.

Regards

Jason Dunn, P.Eng. | Associate

Bunt & Associates Engineering Ltd.
Suite 113, 334 11th Avenue SE, Calgary, AB T2G 0Y2
d 587 349 7573 f 403 252 3323 w www.bunteng.com

From: MPatel@rockyview.ca <MPatel@rockyview.ca>
Sent: February 11, 2020 1:32 PM
To: Jason Dunn <jdunn@bunteng.com>
Subject: RE: Damkar Seniors TIA

Thanks Jason.

I am good with this.

Best Regards,
Milan Patel

From: Jason Dunn <jdunn@bunteng.com>
Sent: Tuesday, February 11, 2020 1:30 PM
To: Milan Patel <MPatel@rockyview.ca>
Subject: RE: Damkar Seniors TIA

Milan,

I chose the 2039 horizon as it's essentially 20 years from today. Going further out than 20 years from today is the type of review when looking at larger regional type requirements rather than the requirements from an individual development.

Regards

Jason Dunn, P.Eng. | Associate

Bunt & Associates Engineering Ltd.
Suite 113, 334 11th Avenue SE, Calgary, AB T2G 0Y2
d 587 349 7573 f 403 252 3323 w www.bunteng.com

From: MPatel@rockyview.ca <MPatel@rockyview.ca>
Sent: February 11, 2020 11:39 AM

To: Jason Dunn <jdunn@bunteng.com>
Cc: NMirza@rockyview.ca
Subject: RE: Damkar Seniors TIA

Hi Jason,

Thank you for sending the scope for the TIA.

I have a question with regards to the future horizon scenarios. Is there a reason why we only have 10 year future horizon scenarios (2039) for the intersections. We normally see 20-year background and after development scenarios for the future horizons.

I am fine with the overall scope otherwise.

Best Regards,

MILAN PATEL, P.ENG
Municipal Engineer | Planning and Development Services

ROCKY VIEW COUNTY
262075 Rocky View Point| Rocky View County | AB | T4A 0X2
Phone: 403-520-7279
MPatel@rockyview.ca | www.rockyview.ca

From: Jason Dunn <jdunn@bunteng.com>
Sent: Monday, February 3, 2020 3:00 PM
To: Noor Mirza <NMirza@rockyview.ca>
Subject: Damkar Seniors TIA

Noor,

Bunt and Associates has been engaged to undertake the TIA for Conceptual Scheme Amendment and Land Use Application for the Damkar Seniors Development located off Damkar Court, adjacent to 12 Mile Coulee Road. The proposed development up to 400 units. This will be split between condos (aimed at a seniors market) and a seniors facility with independent living units and assisted living units. It is expected to be fully developed by 2028. A site plan is attached for reference.

I propose the following scope for the TIA;

1. Review the following intersections
    a. 12 Mile Coulee Road / Crowchild Trail
    b. 12 Mile Coulee Road / Blueridge Rise
    c. 12 Mile Coulee Road / Tusslewood Drive
    d. 12 Mile Coulee Road / Tuscany Way
    e. 12 Mile Coulee Road / Damkar Court
2. Obtain forecast from City of Calgary for 2028 ands 2039 for these intersections
3. Develop site generated traffic volumes using ITE rates
4. Review the background and after development scenarios for both horizon for the listed intersections
5. Identify any mitigation measures required along 12 Mile Coulee Road.
6. Review active modes and connectivity to the site.

Please let me know if this scope is acceptable.

Regards

Jason Dunn, P.Eng. | Associate

Bunt & Associates Engineering Ltd.
Suite 113, 334 11th Avenue SE, Calgary, AB T2G 0Y2
d 587 349 7573 f 403 252 3323 w www.bunteng.com

APPENDIX B

Signal Timing Plan

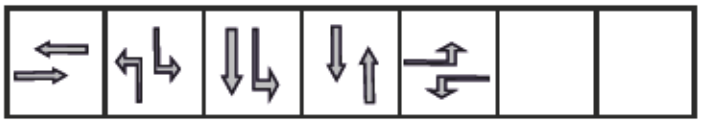
SIGNAL TIMING SUMMARY

LOCATION: Crowchild Tr - 12 Mile Coulee Rd NW **INT #:** 909

Date Coded: November 27, 2017 **Date Installed:** November 28, 2017

TIMING PLAN NO: Max Plan 1

CYCLE LENGTH: Max 159
OFFSET: -
START TIME: 6:00
END TIME: 9:00



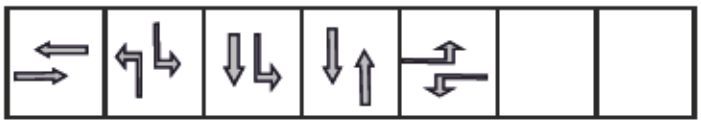
	Pro Only	Pro/ Per	Per Only
NBLT	x		
SBLT	x		
EBLT	x		
WBLT	x		

	5.5+2		3+1	3.5+4	4+2		
MAX	40+8*	10	20	20+21**	15		
MIN if Actuated	27+8*	7	-	10+31**	7		
Pedestrian	8+19	-	-	8+33	-		

*AWF **If Ped Actuated

TIMING PLAN NO: Max Plan 2

CYCLE LENGTH: Max 138
OFFSET: -
OPERATION TIMES: 9:00 / 15:30



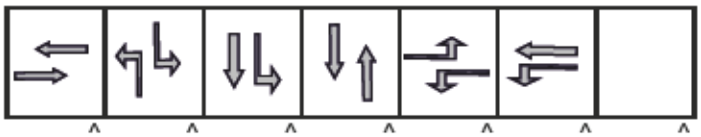
	Pro Only	Pro/ Per	Per Only
NBLT	x		
SBLT	x		
EBLT	x		
WBLT	x		

	5.5+2		3+1	3.5+4	4+2		
MAX	29+ 8*	10	10	20+21**	15		
MIN if Actuated	27+ 8*	7	-	10+31**	7		
Pedestrian	8+19	-	-	8+33	-		

*AWF **If Ped Actuated

TIMING PLAN NO: Max Plan 3

CYCLE LENGTH: Max 141
OFFSET: -
START TIME: 15:30
END TIME: 19:00



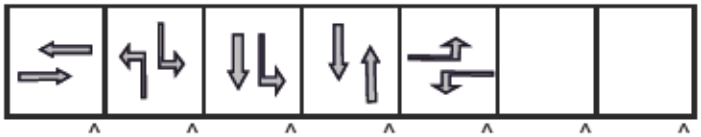
	Pro Only	Pro/ Per	Per Only
NBLT	x		
SBLT	x		
EBLT	x		
WBLT	x		

	5.5+2		3+1	3.5+4		4+2	
MAX	30+ 8*	10	5	20+21**	15	7	
MIN if Actuated	27+ 8*	7	-	10+31**	7	-	
Pedestrian	8+19	-	-	8+33	-	-	

*AWF **If Ped Actuated

TIMING PLAN NO: MAX I

CYCLE LENGTH: Max 136
OFFSET: -
START TIME: 19:00
END TIME: 6:00
ALL DAY SAT & SUN



	Pro Only	Pro/ Per	Per Only
NBLT	x		
SBLT	x		
EBLT	x		
WBLT	x		

	5.5+2		3+1	3.5+4	4+2		
MAX	27+8*	15	5	20+21**	15		
MIN if Actuated	27+8*	7	-	10+31**	7		
Pedestrian	8+19	-	-	8+33	-		

*AWF **If Ped Actuated

TIMING PLAN NO:

CYCLE LENGTH:
OFFSET:
START TIME:
END TIME:

	Pro Only	Pro/ Per	Per Only
NBLT			
SBLT			
EBLT			
WBLT			

MAX							
MIN if Actuated							
Pedestrian							

Notes: The offset point is referenced to the beginning of the first column of traffic movements.
If the max time is less than the pedestrian time, the extra unused pedestrian time is passed to the main street unless otherwise noted.
If any of the summary is unclear, please contact the Signals Division with the City of Calgary, by phoning 311.

APPENDIX C

Traffic Data

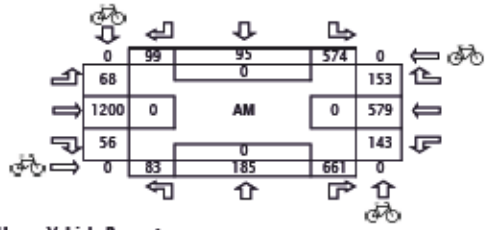
Intersection Turning Movement Count Summary: 12 Mile Coulee Road NW & Crowchild Trail NW

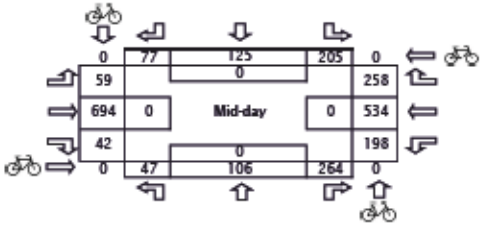
N/S Road:	12 Mile Coulee Road NW		**AM Peak Hour:**	7:30 AM	to 8:30 AM	**PHF (AM Peak Hour):**	0.92
E/W Road:	Crowchild Trail NW		**Mid-day Peak Hou**	11:30 AM	to 12:30 PM	**PHF (Mid-day Peak Hour**	0.93
Count Date:	February 5, 2020	Wednesday	**PM Peak Hour:**	4:30 PM	to 5:30 PM	**PHF (PM Peak Hour):**	0.99
Weather:	Cloudy						
Road Condition:	Good						
Project #:	02-20-0012						

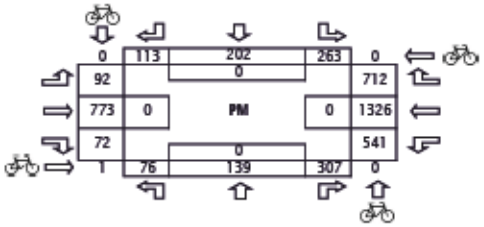
bunt & associates

	12 Mile Coulee Road NW												Crowchild Trail NW																			
	Northbound (South Leg)						Southbound (North Leg)						Westbound (East Leg)						Eastbound (West Leg)								Pedestrians				Cyclists			
	Left		Through		Right		Left		Through		Right		Left		Through		Right		Left		Through		Right		Total	Vehicle	West	East	North	South				
Time Starting	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	15 Min	Hourly	Side	Side	Side	Side	NB	SB	WB	EB
7:00	12	0	15	0	178	0	171	0	9	1	14	0	12	4	89	7	21	0	9	0	400	0	9	1	952		0	0	0	0	0	0	0	0
7:15	10	0	14	0	173	2	159	2	7	5	4	0	24	4	106	13	23	3	10	3	372	1	12	0	947		0	0	0	0	0	0	0	0
7:30	13	1	24	0	177	1	163	4	11	5	12	0	22	3	131	4	27	3	11	0	359	2	9	1	983		0	0	0	0	0	0	0	0
7:45	14	1	40	0	158	3	120	3	14	4	15	0	34	4	159	3	27	2	17	1	277	10	18	1	925	3807	0	0	0	0	0	0	0	0
8:00	23	3	51	0	154	2	154	1	29	3	18	0	31	3	130	9	40	2	14	0	252	1	10	1	931	3786	0	0	0	0	0	0	0	0
8:15	26	2	69	1	164	2	128	1	28	1	54	0	41	5	129	14	50	2	25	0	294	5	16	0	1057	3896	0	0	0	0	0	0	0	0
8:30	30	0	34	2	139	2	124	1	25	2	23	0	48	1	128	9	46	4	15	0	226	4	15	1	879	3792	0	0	0	0	0	0	0	0
8:45	14	2	45	1	123	7	89	2	29	4	20	1	35	2	128	6	56	3	13	0	183	3	11	2	779	3646	0	0	0	0	0	0	0	0
2 Hour Total	142	9	292	4	1266	19	1108	14	152	25	160	1	247	26	1000	65	290	19	114	4	2363	26	100	7			0	0	0	0	0	0	0	0
		151		296		1285		1122		177		161		273		1065		309		118		2389		107	7453									
Peak Hour Total	76	7	184	1	653	8	565	9	82	13	99	0	128	15	549	30	144	9	67	1	1182	18	53	3			0	0	0	0	0	0	0	0
		83		185		661		574		95		99		143		579		153		68		1200		56		3896								
11:00	15	1	29	0	60	3	47	0	23	1	10	0	44	3	115	8	55	2	12	0	143	4	6	0	581		0	0	0	0	0	0	0	0
11:15	18	1	20	1	60	2	59	2	35	2	16	2	50	2	133	3	49	1	13	1	164	8	8	0	650		0	1	0	0	0	0	0	0
11:30	5	1	36	1	64	3	46	1	27	3	17	1	48	1	129	4	70	0	11	0	179	8	10	0	665		0	0	0	0	0	0	0	0
11:45	9	1	20	1	51	2	43	0	36	2	20	2	46	2	127	5	63	1	14	0	143	10	10	1	609	2505	0	0	0	0	0	0	0	0
12:00	14	1	20	1	62	2	51	1	38	1	18	0	44	2	118	11	56	1	15	1	162	4	10	0	633	2557	0	0	0	0	0	0	0	0
12:15	15	1	25	2	77	3	63	0	16	2	19	0	52	3	130	10	64	3	18	0	182	6	11	0	702	2609	0	0	0	0	0	0	0	0
12:30	12	0	21	1	45	3	50	3	47	1	19	2	52	3	120	5	65	3	13	1	145	8	16	0	635	2579	0	2	0	0	0	0	0	0
12:45	7	0	24	0	44	2	50	0	37	1	8	0	64	0	125	1	62	2	14	0	115	11	8	0	575	2545	0	2	0	0	0	0	0	0
2 Hour Total	95	6	195	7	463	20	409	7	259	13	127	7	400	16	997	47	484	13	110	3	1233	59	79	1			0	5	0	0	0	0	0	0
		101		202		483		416		272		134		416		1044		497		113		1292		80	5050									
Peak Hour Total	43	4	101	5	254	10	203	2	117	8	74	3	190	8	504	30	253	5	58	1	666	28	41	1			0	0	0	0	0	0	0	0
		47		106		264		205		125		77		198		534		258		59		694		42		2609								
16:00	13	0	31	3	72	2	56	3	52	2	27	3	126	1	315	4	136	4	13	2	154	6	21	1	1047		0	0	0	0	0	0	0	0
16:15	18	0	29	4	72	2	56	4	39	3	27	0	125	2	317	5	189	2	24	0	176	7	15	1	1117		0	0	0	0	1	0	0	0
16:30	16	4	35	1	76	3	59	1	36	0	29	2	136	0	347	4	189	3	24	0	167	3	19	1	1155		0	0	0	0	0	0	0	0
16:45	16	0	34	0	76	1	57	1	50	3	23	1	128	0	329	4	164	1	34	1	199	7	15	0	1144	4463	0	0	0	0	0	0	0	1
17:00	15	0	36	0	61	2	72	1	61	0	28	0	152	0	326	4	187	0	16	0	187	2	15	0	1165	4581	0	0	0	0	0	0	0	0
17:15	25	0	33	0	87	1	71	1	52	0	30	0	125	0	306	6	167	1	17	0	203	5	22	0	1152	4616	0	0	0	0	0	0	0	0
17:30	19	0	41	0	71	0	60	0	34	0	30	0	121	0	299	2	178	0	13	0	162	5	21	0	1056	4517	0	0	0	0	0	0	0	0
17:45	17	0	34	1	93	0	54	1	58	0	29	0	116	0	231	2	140	0	14	0	133	13	23	0	959	4332	0	0	0	0	0	0	0	0
2 Hour Total	139	4	273	9	608	11	485	12	382	8	223	6	1029	3	2470	31	1350	11	155	3	1381	48	151	3			0	0	0	0	1	0	0	1
		143		282		619		497		390		229		1032		2501		1361		158		1429		154	8795									
Peak Hour Total	72	4	138	1	300	7	259	4	199	3	110	3	541	0	1308	18	707	5	91	1	756	17	71	1			0	0	0	0	0	0	0	1
		76		139		307		263		202		113		541		1326		712		92		773		72		4616								
6 Hour Total	376	19	760	20	2337	50	2002	33	793	46	510	14	1676	45	4467	143	2124	43	379	10	4977	133	330	11			0	5	0	0	1	0	0	1
		395		780		2387		2035		839		524		1721		4610		2167		389		5110		341	21298									

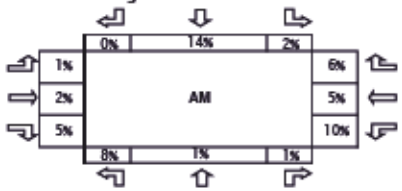
Peak Hour Volumes

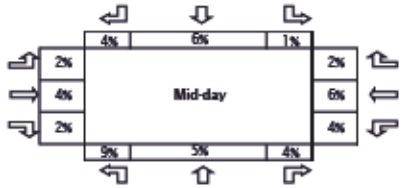


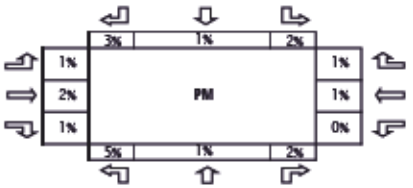




Heavy Vehicle Percentage







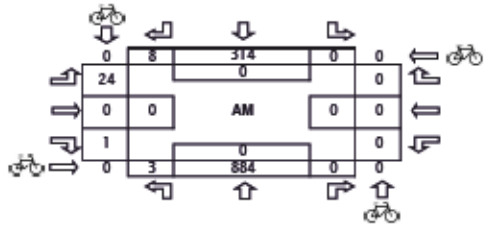
Intersection Turning Movement Count Summary: 12 Mile Coulee Road NW & Blue Ridge Rise NW

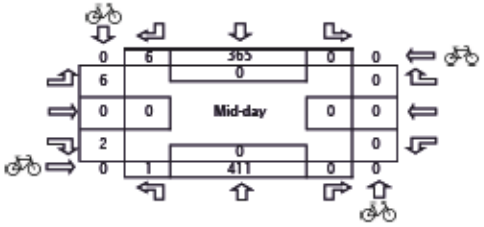
N/S Road:	12 Mile Coulee Road NW		**AM Peak Hour:**	7:45 AM	to	8:45 AM	**PHF (AM Peak Hour):**	0.90
E/W Road:	Blue Ridge Rise NW		**Mid-day Peak Hou**	11:30 AM	to	12:30 PM	**PHF (Mid-day Peak Hour**	0.95
Count Date:	February 5, 2020	Wednesday	**PM Peak Hour:**	4:30 PM	to	5:30 PM	**PHF (PM Peak Hour):**	0.93
Weather:	Cloudy							
Road Condition:	Good							
Project #:	02-20-0012							

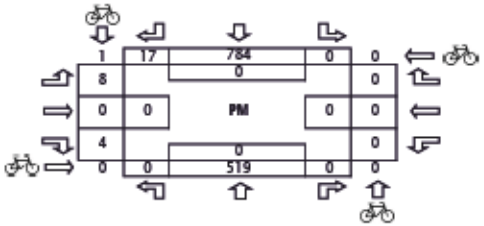
bunt & associates

	12 Mile Coulee Road NW												Blue Ridge Rise NW																			
	Northbound (South Leg)						Southbound (North Leg)						Westbound (East Leg)						Eastbound (West Leg)								Pedestrians				Cyclists			
	Left		Through		Right		Left		Through		Right		Left		Through		Right		Left		Through		Right		Total	Vehicle	West	East	North	South				
Time Starting	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	15 Min	Hourly	Side	Side	Side	Side	NB	SB	WB	EB
7:00	0	0	201	0	0	0	0	0	27	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	235		0	0	0	0	0	0	0	0
7:15	0	0	191	1	0	0	0	0	36	8	1	0	0	0	0	0	0	0	5	0	0	0	0	0	242		0	0	0	0	0	0	0	0
7:30	1	0	215	2	0	0	0	0	40	8	1	1	0	0	0	0	0	0	4	0	0	0	1	0	273		0	0	0	0	0	0	0	0
7:45	0	0	211	3	0	0	0	0	63	10	1	0	0	0	0	0	0	0	3	1	0	0	0	0	292	1042	0	0	0	0	0	0	0	0
8:00	2	0	214	5	0	0	0	0	62	6	2	1	0	0	0	0	0	0	8	2	0	0	1	0	303	1110	0	0	0	0	0	0	0	0
8:15	0	0	253	4	0	0	0	0	74	7	1	0	0	0	0	0	0	0	4	0	0	0	0	0	343	1211	0	0	0	0	0	0	0	0
8:30	1	0	189	5	0	0	0	0	88	4	3	0	0	0	0	0	0	0	6	0	0	0	0	0	296	1234	0	0	0	0	0	0	0	0
8:45	0	0	183	8	0	0	0	0	67	6	1	0	0	0	0	0	0	0	3	0	0	0	0	0	268	1210	0	0	0	0	0	0	0	0
2 Hour Total	4	0	1657	28	0	0	0	0	457	55	11	2	0	0	0	0	0	0	33	3	0	0	2	0			0	0	0	0	0	0	0	0
		4		1685		0		0		512		13		0		0		0		36		0		2	2252									
Peak Hour Total	3	0	867	17	0	0	0	0	287	27	7	1	0	0	0	0	0	0	21	3	0	0	1	0			0	0	0	0	0	0	0	0
		3		884		0		0		314		8		0		0		0		24		0		1		1234								
11:00	0	0	101	4	0	0	0	0	66	4	1	0	0	0	0	0	0	0	3	0	0	0	0	0	179		0	0	0	0	0	0	0	0
11:15	0	0	92	4	0	0	0	0	87	3	3	0	0	0	0	0	0	0	2	0	0	0	0	0	191		0	0	0	0	0	0	0	0
11:30	0	0	103	5	0	0	0	0	92	5	0	1	0	0	0	0	0	0	2	0	0	0	0	1	209		0	0	0	0	0	0	0	0
11:45	0	0	80	4	0	0	0	0	88	4	2	0	0	0	0	0	0	0	2	0	0	0	1	0	181	760	0	0	0	0	0	0	0	0
12:00	1	0	93	5	0	0	0	0	89	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	195	776	0	0	0	0	0	0	0	0
12:15	0	0	116	5	0	0	0	0	78	4	0	1	0	0	0	0	0	0	2	0	0	0	0	0	206	791	0	0	0	0	0	0	0	0
12:30	0	0	73	4	0	0	0	0	105	4	1	0	0	0	0	0	0	0	0	0	0	0	2	0	189	771	1	0	0	0	0	0	0	0
12:45	0	0	76	2	0	0	0	0	109	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	190	780	0	0	0	0	0	0	0	0
2 Hour Total	1	0	734	33	0	0	0	0	714	30	11	2	0	0	0	0	0	0	11	0	0	0	3	1			1	0	0	0	0	0	0	0
		1		767		0		0		744		13		0		0		0		11		0		4	1540									
Peak Hour Total	1	0	392	19	0	0	0	0	347	18	4	2	0	0	0	0	0	0	6	0	0	0	1	1			0	0	0	0	0	0	0	0
		1		411		0		0		365		6		0		0		0		6		0		2		791								
16:00	1	0	112	6	0	0	0	0	184	4	7	0	0	0	0	0	0	0	2	0	0	0	0	1	317		0	0	0	0	0	0	0	0
16:15	1	0	111	5	0	0	0	0	174	6	3	0	0	0	0	0	0	0	4	0	0	0	1	0	305		0	0	0	0	1	0	0	0
16:30	0	0	128	7	0	0	0	0	186	0	3	1	0	0	0	0	0	0	2	1	0	0	0	0	328		0	0	0	0	0	0	0	0
16:45	0	0	124	1	0	0	0	0	179	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	309	1259	0	0	0	0	0	1	0	0
17:00	0	0	112	2	0	0	0	0	211	1	5	0	0	0	0	0	0	0	2	0	0	0	2	0	335	1277	0	0	0	0	0	0	0	0
17:15	0	0	144	1	0	0	0	0	205	0	6	0	0	0	0	0	0	0	3	0	0	0	1	0	360	1332	0	0	0	0	0	0	0	0
17:30	2	0	122	0	0	0	0	0	171	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	299	1303	0	0	0	0	0	0	0	0
17:45	0	0	141	1	0	0	0	0	185	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	331	1325	0	0	0	0	0	0	0	0
2 Hour Total	4	0	994	23	0	0	0	0	1495	14	26	1	0	0	0	0	0	0	18	1	0	0	7	1			0	0	0	0	1	1	0	0
		4		1017		0		0		1509		27		0		0		0		19		0		8	2584									
Peak Hour Total	0	0	508	11	0	0	0	0	781	3	16	1	0	0	0	0	0	0	7	1	0	0	4	0			0	0	0	0	0	1	0	0
		0		519		0		0		784		17		0		0		0		8		0		4		1332								
6 Hour Total	9	0	3385	84	0	0	0	0	2666	99	48	5	0	0	0	0	0	0	62	4	0	0	12	2			1	0	0	0	1	1	0	0
		9		3469		0		0		2765		53		0		0		0		66		0		14		6376								

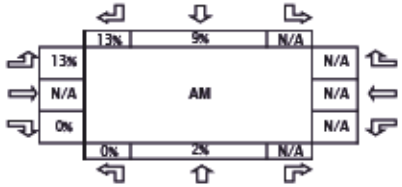
Peak Hour Volumes

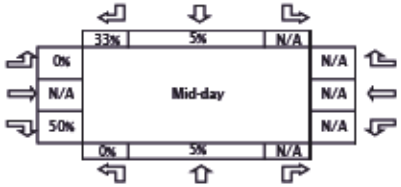


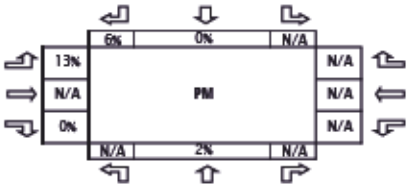




Heavy Vehicle Percentage







Intersection Turning Movement Count Summary: 12 Mile Coulee Road NW & Tusslewood Drive NW

N/S Road: 12 Mile Coulee Road NW
E/W Road: Tusslewood Drive NW
Count Date: February 5, 2020 Wednesday
Weather: Cloudy
Road Condition: Good
Project #: 02-20-0012

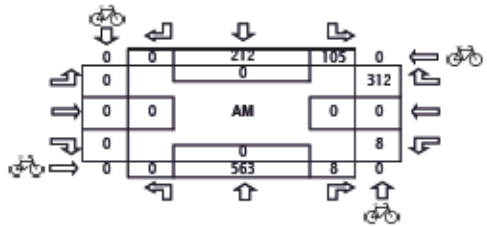
AM Peak Hour: 7:45 AM to 8:45 AM
Mid-day Peak Hou 11:30 AM to 12:30 PM
PM Peak Hour: 4:30 PM to 5:30 PM

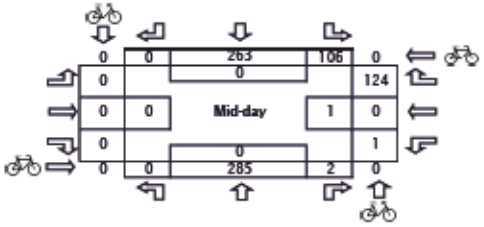
PHF (AM Peak Hour): 0.89
PHF (Mid-day Peak Hour 0.93
PHF (PM Peak Hour): 0.94

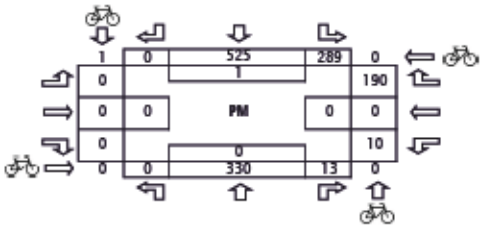
bunt & associates

	12 Mile Coulee Road NW												Tusslewood Drive NW														Pedestrians				Cyclists			
	Northbound (South Leg)						Southbound (North Leg)						Westbound (East Leg)						Eastbound (West Leg)															
Time Starting	Left		Through		Right		Left		Through		Right		Left		Through		Right		Left		Through		Right		Total	Vehicle	West	East	North	South				
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	15 Min	Hourly	Side	Side	Side	Side	NB	SB	WB	EB
7:00	0	0	115	0	2	0	9	1	23	4	0	0	3	0	0	0	88	0	0	0	0	0	0	0	245		0	0	0	0	0	0	0	0
7:15	0	0	111	1	0	0	13	2	24	6	0	0	0	0	0	0	78	0	0	0	0	0	0	0	235		0	0	0	0	0	0	0	0
7:30	0	0	121	1	3	0	10	2	30	5	0	0	2	0	0	0	94	1	0	0	0	0	0	0	269		0	0	0	0	0	0	0	0
7:45	0	0	124	3	2	0	23	6	41	3	0	0	1	0	0	0	85	0	0	0	0	0	0	0	288	1037	0	0	0	0	0	0	0	0
8:00	0	0	133	4	2	0	24	2	41	3	0	0	3	0	0	0	80	1	0	0	0	0	0	0	293	1085	0	0	0	0	0	0	0	0
8:15	0	0	159	2	3	0	21	4	53	3	0	0	2	0	0	0	89	2	0	0	0	0	0	0	338	1188	0	0	0	0	0	0	0	0
8:30	0	0	136	2	1	0	23	2	65	3	0	0	1	1	0	0	52	3	0	0	0	0	0	0	289	1208	0	0	0	0	0	0	0	0
8:45	0	0	111	5	5	0	26	1	43	5	0	0	2	0	0	0	70	3	0	0	0	0	0	0	271	1191	0	0	0	0	0	0	0	0
2 Hour Total	0	0	1010	18	18	0	149	20	320	32	0	0	14	1	0	0	636	10	0	0	0	0	0	0			0	0	0	0	0	0	0	0
		0		1028		18		169		352		0		15		0		646		0		0		0	2228									
Peak Hour Total	0	0	552	11	8	0	91	14	200	12	0	0	7	1	0	0	306	6	0	0	0	0	0	0			0	0	0	0	0	0	0	0
		0		563		8		105		212		0		8		0		312		0		0		0		1208								
11:00	0	0	63	4	1	0	31	0	40	4	0	0	2	0	0	0	38	0	0	0	0	0	0	0	183		0	0	0	0	0	0	0	0
11:15	0	0	63	3	1	0	30	0	56	4	0	0	0	0	0	0	31	1	0	0	0	0	0	0	189		0	0	0	0	0	0	0	0
11:30	0	0	72	5	1	0	25	2	66	4	0	0	1	0	0	0	34	0	0	0	0	0	0	0	210		0	1	0	0	0	0	0	0
11:45	0	0	56	2	0	0	33	1	57	3	0	0	0	0	0	0	23	1	0	0	0	0	0	0	176	758	0	0	0	0	0	0	0	0
12:00	0	0	64	4	1	0	24	1	63	5	0	0	0	0	0	0	29	0	0	0	0	0	0	0	191	766	0	0	0	0	0	0	0	0
12:15	0	0	79	3	0	0	20	0	61	4	0	0	0	0	0	0	36	1	0	0	0	0	0	0	204	781	0	0	0	0	0	0	0	0
12:30	0	0	49	4	0	0	24	1	83	3	0	0	0	0	0	0	26	0	0	0	0	0	0	0	190	761	0	0	1	0	0	0	0	0
12:45	0	0	50	3	2	0	35	1	73	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	187	772	0	0	0	0	0	0	0	0
2 Hour Total	0	0	496	28	6	0	222	6	499	27	0	0	3	0	0	0	240	3	0	0	0	0	0	0			0	1	1	0	0	0	0	0
		0		524		6		228		526		0		3		0		243		0		0		0	1530									
Peak Hour Total	0	0	271	14	2	0	102	4	247	16	0	0	1	0	0	0	122	2	0	0	0	0	0	0			0	1	0	0	0	0	0	0
		0		285		2		106		263		0		1		0		124		0		0		0		781								
16:00	0	0	63	4	0	0	69	0	120	5	0	0	3	0	0	0	47	2	0	0	0	0	0	0	313		0	0	0	0	0	0	0	0
16:15	0	0	70	4	0	0	62	2	124	4	0	0	0	0	0	0	43	1	0	0	0	0	0	0	310		0	0	0	0	1	0	0	0
16:30	0	0	83	5	4	0	72	0	119	0	0	0	2	0	0	0	46	2	0	0	0	0	0	0	333		0	0	0	0	0	0	0	0
16:45	0	0	76	0	0	0	67	0	119	2	0	0	3	0	0	0	49	1	0	0	0	0	0	0	317	1273	0	0	0	0	0	1	0	0
17:00	0	0	73	2	6	0	77	0	146	1	0	0	3	0	0	0	39	0	0	0	0	0	0	0	347	1307	0	0	1	0	0	0	0	0
17:15	0	0	90	1	3	0	73	0	138	0	0	0	2	0	0	0	53	0	0	0	0	0	0	0	360	1357	0	0	0	0	0	0	0	0
17:30	0	0	75	0	0	0	69	0	113	0	0	0	2	0	0	0	50	0	0	0	0	0	0	0	309	1333	0	0	0	0	0	0	0	0
17:45	0	0	81	1	1	0	71	0	118	0	0	0	1	0	0	0	58	0	0	0	0	0	0	0	331	1347	0	0	0	0	1	0	0	0
2 Hour Total	0	0	611	17	14	0	560	2	997	12	0	0	16	0	0	0	385	6	0	0	0	0	0	0			0	0	1	0	2	1	0	0
		0		628		14		562		1009		0		16		0		391		0		0		0	2620									
Peak Hour Total	0	0	322	8	13	0	289	0	522	3	0	0	10	0	0	0	187	3	0	0	0	0	0	0			0	0	1	0	0	1	0	0
		0		330		13		289		525		0		10		0		190		0		0		0		1357								
6 Hour Total	0	0	2117	63	38	0	931	28	1816	71	0	0	33	1	0	0	1261	19	0	0	0	0	0	0			0	1	2	0	2	1	0	0
		0		2180		38		959		1887		0		34		0		1280		0		0		0		6378								

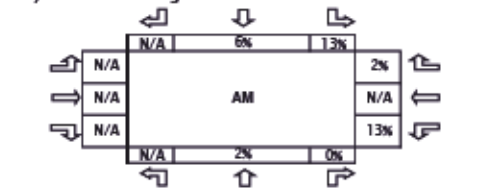
Peak Hour Volumes

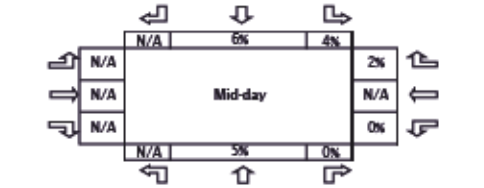


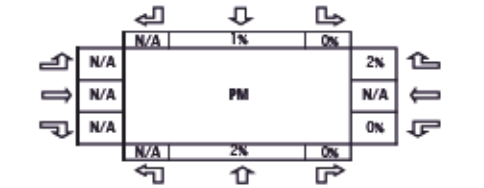




Heavy Vehicle Percentage







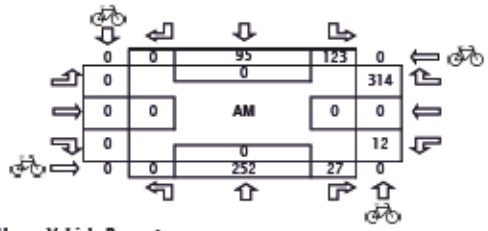
Intersection Turning Movement Count Summary: 12 Mile Coulee Road NW & Tuscany Way NW

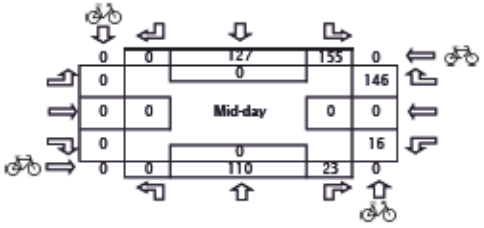
N/S Road:	12 Mile Coulee Road NW		**AM Peak Hour:**	7:45 AM	to	8:45 AM	**PHF (AM Peak Hour):**	0.90
E/W Road:	Tuscany Way NW		**Mid-day Peak Hou**	12:00 PM	to	1:00 PM	**PHF (Mid-day Peak Hour**	0.92
Count Date:	February 5, 2020	**Wednesday**	**PM Peak Hour:**	4:30 PM	to	5:30 PM	**PHF (PM Peak Hour):**	0.93
Weather:	Cloudy							
Road Condition:	Good							
Project #:	02-20-0012							

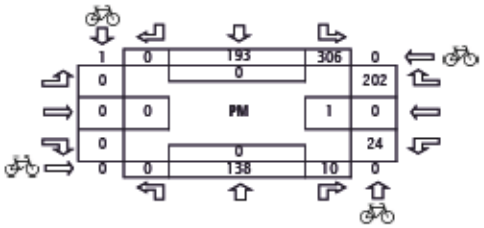
bunt & associates

	12 Mile Coulee Road NW												Tuscany Way NW																			
	Northbound (South Leg)						Southbound (North Leg)						Westbound (East Leg)						Eastbound (West Leg)								Pedestrians				Cyclists			
Time Starting	Left		Through		Right		Left		Through		Right		Left		Through		Right		Left		Through		Right		Total Vehicle		West	East	North	South				
	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	Car	Truck	15 Min	Hourly	Side	Side	Side	Side	NB	SB	WB	EB
7:00	0	0	39	0	7	1	11	2	13	3	0	0	0	0	0	0	80	0	0	0	0	0	0	0	156		0	0	0	0	0	0	0	0
7:15	0	0	41	0	8	2	13	3	11	3	0	0	1	0	0	0	74	1	0	0	0	0	0	0	157		0	0	0	0	0	0	0	0
7:30	0	0	44	0	6	0	18	3	9	2	0	0	4	0	0	0	77	1	0	0	0	0	0	0	164		0	0	0	0	0	0	0	0
7:45	0	0	48	1	5	0	23	1	23	2	0	0	3	0	0	0	73	3	0	0	0	0	0	0	182	659	0	0	0	0	0	0	0	0
8:00	0	0	81	2	9	0	28	1	13	1	0	0	1	0	0	0	61	2	0	0	0	0	0	0	199	702	0	0	0	0	0	0	0	0
8:15	0	0	68	2	4	0	34	3	21	1	0	0	2	0	0	0	93	1	0	0	0	0	0	0	229	774	0	0	0	0	0	0	0	0
8:30	0	0	49	1	9	0	32	1	31	3	0	0	6	0	0	0	81	0	0	0	0	0	0	0	213	823	0	0	0	0	0	0	0	0
8:45	0	0	39	3	1	0	26	2	19	3	0	0	5	0	0	0	74	2	0	0	0	0	0	0	174	815	0	0	0	0	0	0	0	0
2 Hour Total	0	0	409	9	49	3	185	16	140	18	0	0	22	0	0	0	613	10	0	0	0	0	0	0			0	0	0	0	0	0	0	0
		0		418		52		201		158		0		22		0		623		0		0		0	1474									
Peak Hour Total	0	0	246	6	27	0	117	6	88	7	0	0	12	0	0	0	308	6	0	0	0	0	0	0			0	0	0	0	0	0	0	0
		0		252		27		123		95		0		12		0		314		0		0		0		823								
11:00	0	0	26	4	4	0	25	3	20	2	0	0	2	0	0	0	36	0	0	0	0	0	0	0	122		0	0	0	0	0	0	0	0
11:15	0	0	30	3	5	0	29	4	18	0	0	0	2	2	0	0	36	0	0	0	0	0	0	0	129		0	0	0	0	0	0	0	0
11:30	0	0	27	3	5	0	47	1	25	2	0	0	0	0	0	0	41	2	0	0	0	0	0	0	153		0	0	0	0	0	0	0	0
11:45	0	0	27	3	3	0	29	0	25	3	0	0	3	0	0	0	26	0	0	0	0	0	0	0	119	523	0	0	1	0	0	0	0	0
12:00	0	0	29	4	7	0	37	0	24	4	0	0	3	0	0	0	33	1	0	0	0	0	0	0	142	543	0	0	0	0	0	0	0	0
12:15	0	0	29	3	6	1	32	1	23	3	0	0	3	0	0	0	48	1	0	0	0	0	0	0	150	564	0	0	0	0	0	0	0	0
12:30	0	0	25	2	3	0	54	1	33	2	0	0	3	0	0	0	30	3	0	0	0	0	0	0	156	567	0	0	0	0	0	0	0	0
12:45	0	0	18	0	6	0	30	0	38	0	0	0	7	0	0	0	29	1	0	0	0	0	0	0	129	577	0	0	0	0	0	0	0	0
2 Hour Total	0	0	211	22	39	1	283	10	206	16	0	0	23	2	0	0	279	8	0	0	0	0	0	0			0	0	1	0	0	0	0	0
		0		233		40		293		222		0		25		0		287		0		0		0	1100									
Peak Hour Total	0	0	101	9	22	1	153	2	118	9	0	0	16	0	0	0	140	6	0	0	0	0	0	0			0	0	0	0	0	0	0	0
		0		110		23		155		127		0		16		0		146		0		0		0		577								
16:00	0	0	30	1	1	0	64	3	54	1	0	0	7	1	0	0	42	3	0	0	0	0	0	0	207		0	0	0	0	0	0	0	0
16:15	0	0	32	2	6	0	75	3	44	2	0	0	7	1	0	0	35	2	0	0	0	0	0	0	209		0	0	0	0	0	0	1	0
16:30	0	0	33	2	2	1	70	0	49	0	0	0	8	0	0	0	54	3	0	0	0	0	0	0	222		0	0	0	0	0	0	0	0
16:45	0	0	29	0	3	0	69	1	46	1	0	0	4	0	0	0	44	0	0	0	0	0	0	0	197	835	0	0	0	0	0	1	0	0
17:00	0	0	36	2	0	0	80	1	49	0	0	0	7	0	0	0	44	0	0	0	0	0	0	0	219	847	0	1	0	0	0	0	0	0
17:15	0	0	36	0	4	0	85	0	48	0	0	0	5	0	0	0	56	1	0	0	0	0	0	0	235	873	0	0	0	0	0	0	0	0
17:30	0	0	23	0	3	0	72	0	45	0	0	0	4	0	0	0	55	0	0	0	0	0	0	0	202	853	0	0	0	0	0	0	0	0
17:45	0	0	24	1	4	0	73	1	46	0	0	0	7	0	0	0	56	0	0	0	0	0	0	0	212	868	0	0	0	0	0	0	0	0
2 Hour Total	0	0	243	8	23	1	588	9	381	4	0	0	49	2	0	0	386	9	0	0	0	0	0	0			0	1	0	0	0	1	1	0
		0		251		24		597		385		0		51		0		395		0		0		0	1703									
Peak Hour Total	0	0	134	4	9	1	304	2	192	1	0	0	24	0	0	0	198	4	0	0	0	0	0	0			0	1	0	0	0	1	0	0
		0		138		10		306		193		0		24		0		202		0		0		0		873								
6 Hour Total	0	0	863	39	111	5	1056	35	727	38	0	0	94	4	0	0	1278	27	0	0	0	0	0	0			0	1	1	0	0	1	1	0
		0		902		116		1091		765		0		98		0		1305		0		0		0		4277								

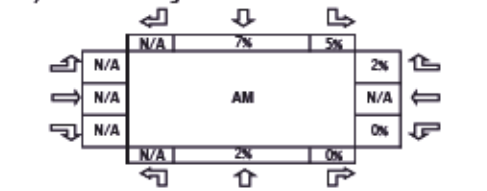
Peak Hour Volumes

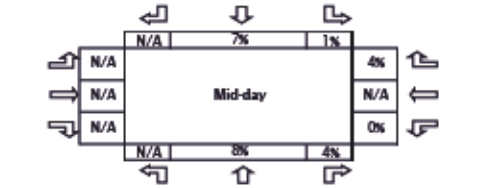


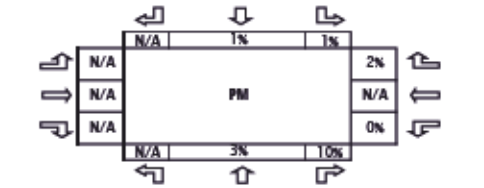




Heavy Vehicle Percentage







APPENDIX D

Synchro Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1470	121	274	790	210	126	227	724	600	126	100
Future Volume (vph)	50	1470	121	274	790	210	126	227	724	600	126	100
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.97	1.00		0.97	0.99		0.98	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3306	3408	1525	3181	3279	1467	1704	3408	1525	3273	3375	1525
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	3408	1479	3172	3279	1423	1690	3408	1500	3251	3375	1500
Satd. Flow (RTOR)			155			223			384			218
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	6%	6%	6%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	53	1564	129	291	840	223	134	241	770	638	134	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	1564	129	291	840	223	134	241	770	638	134	106
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	27.0	27.0	7.0	27.0	27.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	13.0	34.5	34.5	13.0	34.5	34.5	11.0	17.5		11.0	17.5	
Total Split (s)	21.0	47.5	47.5	21.0	47.5	47.5	14.0	27.5		34.0	47.5	
Total Split (%)	16.2%	36.5%	36.5%	16.2%	36.5%	36.5%	10.8%	21.2%		26.2%	36.5%	
Maximum Green (s)	15.0	40.0	40.0	15.0	40.0	40.0	10.0	20.0		30.0	40.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.0	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0		1.0	4.0	
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)	6.0	7.5	7.5	6.0	7.5	7.5	4.0	7.5		4.0	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		8.0	8.0		8.0	8.0		8.0			8.0	
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		33.0			33.0	
Pedestrian Calls (#/hr)		10	10		10	10		10			10	
Act Effct Green (s)	7.9	40.5	40.5	14.4	49.9	49.9	10.1	17.6	125.0	27.3	34.7	125.0
Actuated g/C Ratio	0.06	0.32	0.32	0.12	0.40	0.40	0.08	0.14	1.00	0.22	0.28	1.00
v/c Ratio	0.25	1.42	0.22	0.80	0.64	0.32	0.98	0.50	0.51	0.89	0.14	0.07

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	62.8	225.5	4.2	71.8	36.5	5.6	128.8	52.8	1.3	64.1	32.9	0.1
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	62.8	225.5	4.2	71.8	36.5	5.6	128.8	52.8	1.3	64.1	32.9	0.1
LOS	E	F	A	E	D	A	F	D	A	E	C	A
Approach Delay		205.1			39.0			27.0			51.6	
Approach LOS		F			D			C			D	
Queue Length 50th (m)	6.7	~281.9	0.0	37.4	91.8	0.0	34.7	31.3	0.0	79.8	13.7	0.0
Queue Length 95th (m)	15.9	#427.4	10.3	#76.4	160.0	20.6	#96.5	44.3	0.0	#145.5	21.3	0.0
Internal Link Dist (m)		391.1			381.1			416.2			342.9	
Turn Bay Length (m)	135.0		180.0	110.0		200.0	55.0		85.0	140.0		100.0
Base Capacity (vph)	401	1103	583	386	1309	702	137	646	1500	794	1186	1500
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	0.13	1.42	0.22	0.75	0.64	0.32	0.98	0.37	0.51	0.80	0.11	0.07

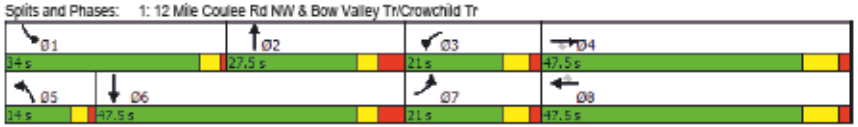
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 125
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 95.1 Intersection LOS: F
Intersection Capacity Utilization 103.8% 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.

Splits and Phases: 1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	24	18	24	1053	513	8
Future Volume (Veh/h)	24	18	24	1053	513	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	26	19	26	1120	546	9
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1182	298	565			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1182	298	565			
tC, single (s)	6.9	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	97	97			
cM capacity (veh/h)	173	687	995			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	45	399	747	364	191
Volume Left	26	26	0	0	0
Volume Right	19	0	0	0	9
cSH	253	995	1700	1700	1700
Volume to Capacity	0.18	0.03	0.44	0.21	0.11
Queue Length 95th (m)	5.1	0.6	0.0	0.0	0.0
Control Delay (s)	22.2	0.8	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	22.2	0.3		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	60.4%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	22	340	737	12	160	371
Future Volume (Veh/h)	22	340	737	12	160	371
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	23	362	784	13	170	395
Pedestrians	10		10			10
Lane Width (m)	3.5		3.5			3.5
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1342	412			794	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1342	412			794	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	38			79	
cM capacity (veh/h)	112	580			816	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	23	362	392	392	13	302	263
Volume Left	23	0	0	0	0	170	0
Volume Right	0	362	0	0	13	0	0
cSH	112	580	1700	1700	1700	816	1700
Volume to Capacity	0.21	0.62	0.23	0.23	0.01	0.21	0.15
Queue Length 95th (m)	5.8	34.5	0.0	0.0	0.0	6.3	0.0
Control Delay (s)	45.4	21.0	0.0	0.0	0.0	7.0	0.0
Lane LOS	E	C				A	
Approach Delay (s)	22.4		0.0			3.7	
Approach LOS	C						

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	52.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	340	399	66	160	213
Future Volume (Veh/h)	70	340	399	66	160	213
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	74	362	424	70	170	227
Pedestrians	10		10			10
Lane Width (m)	3.5		3.5			3.5
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	932	267			504	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	932	267			504	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	50			84	
cM capacity (veh/h)	218	719			1048	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	74	362	283	211	246	151
Volume Left	74	0	0	0	170	0
Volume Right	0	362	0	70	0	0
cSH	218	719	1700	1700	1048	1700
Volume to Capacity	0.34	0.50	0.17	0.12	0.16	0.09
Queue Length 95th (m)	11.4	22.9	0.0	0.0	4.6	0.0
Control Delay (s)	29.7	15.0	0.0	0.0	6.8	0.0
Lane LOS	D	B			A	
Approach Delay (s)	17.5		0.0		4.2	
Approach LOS	C					

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	5	5	456	270	13
Future Volume (Veh/h)	9	5	5	456	270	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	10	5	5	485	287	14
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	566	170	311			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	566	170	311			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	445	830	1236			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	167	323	191	110
Volume Left	10	5	0	0	0
Volume Right	5	0	0	0	14
cSH	526	1236	1700	1700	1700
Volume to Capacity	0.03	0.00	0.19	0.11	0.06
Queue Length 95th (m)	0.7	0.1	0.0	0.0	0.0
Control Delay (s)	12.0	0.3	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	12.0	0.1		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	1050	235	628	1520	740	193	264	398	260	355	220
Future Volume (vph)	200	1050	235	628	1520	740	193	264	398	260	355	220
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3306	3408	1525	3306	3408	1525	1704	3408	1525	3306	3408	1525
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3298	3408	1481	3291	3408	1483	1696	3408	1500	3287	3408	1500
Satd. Flow (RTOR)			247			349			419			312
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	211	1105	247	661	1600	779	203	278	419	274	374	232
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	1105	247	661	1600	779	203	278	419	274	374	232
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	27.0	27.0	7.0	27.0	27.0	7.0	10.0		7.0	1.0	
Minimum Split (s)	13.0	34.5	34.5	13.0	34.5	34.5	11.0	17.5		11.0	17.5	
Total Split (s)	21.0	37.5	37.5	28.0	44.5	44.5	14.0	27.5		19.0	32.5	
Total Split (%)	18.8%	33.5%	33.5%	25.0%	39.7%	39.7%	12.5%	24.6%		17.0%	29.0%	
Maximum Green (s)	15.0	30.0	30.0	22.0	37.0	37.0	10.0	20.0		15.0	25.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.0	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0		1.0	4.0	
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)	6.0	7.5	7.5	6.0	7.5	7.5	4.0	7.5		4.0	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		8.0	8.0		8.0	8.0		8.0			8.0	
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		33.0			33.0	
Pedestrian Calls (#/hr)		10	10		10	10		10			10	
Act Effct Green (s)	11.8	30.3	30.3	22.3	40.8	40.8	10.1	18.1	109.1	13.1	21.1	109.1
Actuated g/C Ratio	0.11	0.28	0.28	0.20	0.37	0.37	0.09	0.17	1.00	0.12	0.19	1.00
v/c Ratio	0.59	1.17	0.42	0.98	1.25	1.01	1.28	0.49	0.28	0.69	0.57	0.15

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	55.0	122.6	7.1	74.5	152.3	54.9	209.5	43.6	0.5	57.0	42.2	0.2
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	55.0	122.6	7.1	74.5	152.3	54.9	209.5	43.6	0.5	57.0	42.2	0.2
LOS	D	F	A	E	F	D	F	D	A	E	D	A
Approach Delay		95.2			110.4			60.9			35.8	
Approach LOS		F			F			E			D	
Queue Length 50th (m)	22.3	~144.8	0.0	72.4	~222.5	108.0	~54.3	30.0	0.0	28.9	39.8	0.0
Queue Length 95th (m)	42.6	#261.3	22.9	#153.6	#384.5	#262.6	#131.3	42.9	0.0	#54.2	53.6	0.0
Internal Link Dist (m)		391.1			381.1			416.2			342.9	
Turn Bay Length (m)	135.0		180.0	110.0		200.0	55.0		85.0	140.0		100.0
Base Capacity (vph)	459	947	590	674	1275	773	158	739	1500	459	897	1500
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	0.46	1.17	0.42	0.98	1.25	1.01	1.28	0.38	0.28	0.60	0.42	0.15

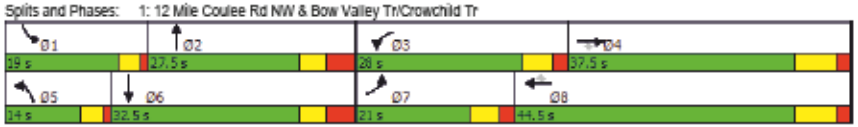
Intersection Summary

Cycle Length: 112
Actuated Cycle Length: 109.1
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.28
Intersection Signal Delay: 89.4 Intersection LOS: F
Intersection Capacity Utilization 97.7% ICU Level of Service F
Analysis Period (min) 15

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

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

Splits and Phases: 1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	5	5	835	1164	54
Future Volume (Veh/h)	20	5	5	835	1164	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	5	5	879	1225	57
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1723	661	1292			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1723	661	1292			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	73	99	99			
cM capacity (veh/h)	78	398	528			

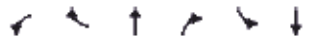
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	298	586	817	465
Volume Left	21	5	0	0	0
Volume Right	5	0	0	0	57
cSH	92	528	1700	1700	1700
Volume to Capacity	0.28	0.01	0.34	0.48	0.27
Queue Length 95th (m)	8.4	0.2	0.0	0.0	0.0
Control Delay (s)	58.6	0.3	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	58.6	0.1		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	47.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	310	525	32	320	848
Future Volume (Veh/h)	52	310	525	32	320	848
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	55	326	553	34	337	893
Pedestrians	10		10			10
Lane Width (m)	3.5		3.5			3.5
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1694	296			563	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1694	296			563	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	53			66	
cM capacity (veh/h)	55	688			996	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	55	326	276	276	34	635	595
Volume Left	55	0	0	0	0	337	0
Volume Right	0	326	0	0	34	0	0
cSH	55	688	1700	1700	1700	996	1700
Volume to Capacity	1.01	0.47	0.16	0.16	0.02	0.34	0.35
Queue Length 95th (m)	36.5	20.4	0.0	0.0	0.0	12.0	0.0
Control Delay (s)	245.6	14.8	0.0	0.0	0.0	7.6	0.0
Lane LOS	F	B				A	
Approach Delay (s)	48.2		0.0			3.9	
Approach LOS	E						

Intersection Summary				
Average Delay	10.5			
Intersection Capacity Utilization	64.7%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	313	210	347	152	390	470
Future Volume (Veh/h)	313	210	347	152	390	470
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	329	221	365	160	411	495
Pedestrians	10		10			10
Lane Width (m)	3.5		3.5			3.5
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1534	282			535	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1534	282			535	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	69			60	
cM capacity (veh/h)	63	703			1021	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	329	221	243	282	576	330
Volume Left	329	0	0	0	411	0
Volume Right	0	221	0	160	0	0
cSH	63	703	1700	1700	1021	1700
Volume to Capacity	5.23	0.31	0.14	0.17	0.40	0.19
Queue Length 95th (m)	Err	10.8	0.0	0.0	15.8	0.0
Control Delay (s)	Err	12.5	0.0	0.0	9.2	0.0
Lane LOS	F	B			A	
Approach Delay (s)	5986.2		0.0		5.8	
Approach LOS	F					

Intersection Summary				
Average Delay	1664.7			
Intersection Capacity Utilization	68.0%	ICU Level of Service		C
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	5	5	487	772	11
Future Volume (Veh/h)	12	5	5	487	772	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	5	5	513	813	12
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1106	432	835			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1106	432	835			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	99			
cM capacity (veh/h)	200	562	788			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	18	176	342	542	283
Volume Left	13	5	0	0	0
Volume Right	5	0	0	0	12
cSH	244	788	1700	1700	1700
Volume to Capacity	0.07	0.01	0.20	0.32	0.17
Queue Length 95th (m)	1.9	0.2	0.0	0.0	0.0
Control Delay (s)	20.9	0.3	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	20.9	0.1		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	35.1%	ICU Level of Service		A
Analysis Period (min)	15			

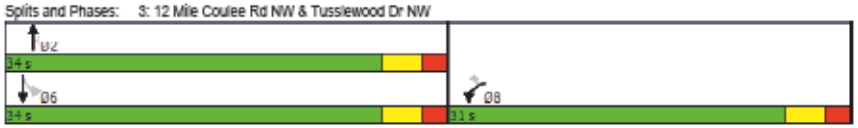
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	22	340	737	12	160	371
Future Volume (vph)	22	340	737	12	160	371
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.96		0.96		1.00
Frt		0.850		0.850		
Flt Protected	0.950					0.985
Satd. Flow (prot)	1704	1525	3408	1525	0	3267
Flt Permitted	0.950					0.603
Satd. Flow (perm)	1691	1491	3408	1469	0	1998
Satd. Flow (RTOR)		100		9		
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	23	362	784	13	170	395
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	362	784	13	0	565
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	31.0	31.0	34.0	34.0	34.0	34.0
Total Split (%)	47.7%	47.7%	52.3%	52.3%	52.3%	52.3%
Maximum Green (s)	26.0	26.0	29.0	29.0	29.0	29.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	Min	Min
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	10	10	10	10	10	10
Act Effct Green (s)	14.9	14.9	22.3	22.3		22.3
Actuated g/C Ratio	0.31	0.31	0.47	0.47		0.47
v/c Ratio	0.04	0.68	0.49	0.02		0.60

3: 12 Mile Coulee Rd NW & Tusslewood Dr NW
03-13-2020
AM Peak Hour
Background 2028_Improved

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	11.5	17.1	10.9	6.4		13.8
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	11.5	17.1	10.9	6.4		13.8
LOS	B	B	B	A		B
Approach Delay	16.8		10.8			13.8
Approach LOS	B		B			B
Queue Length 50th (m)	1.3	17.0	20.4	0.2		15.7
Queue Length 95th (m)	5.7	47.9	50.6	2.9		44.0
Internal Link Dist (m)	383.0		662.4			60.3
Turn Bay Length (m)	30.0			15.0		
Base Capacity (vph)	964	887	2150	930		1260
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	0.02	0.41	0.36	0.01		0.45

Intersection Summary		
Cycle Length: 65		
Actuated Cycle Length: 47.5		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.68		
Intersection Signal Delay: 13.1		Intersection LOS: B
Intersection Capacity Utilization 62.4%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 3: 12 Mile Coulee Rd NW & Tusslewood Dr NW



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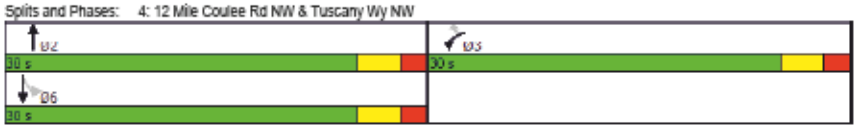
Synchro 9
RSJ

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	70	340	399	66	160	213
Future Volume (vph)	70	340	399	66	160	213
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.99	0.96	0.99			1.00
Frt		0.850	0.979			
Flt Protected	0.950					0.979
Satd. Flow (prot)	1704	1525	3318	0	0	3299
Flt Permitted	0.950					0.657
Satd. Flow (perm)	1690	1490	3318	0	0	2207
Satd. Flow (RTOR)		273	38			
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	74	362	424	70	170	227
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	362	494	0	0	397
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	
Detector Phase	3	3	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	27.0	27.0	25.0		25.0	25.0
Total Split (s)	30.0	30.0	30.0		30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%		50.0%	50.0%
Maximum Green (s)	25.0	25.0	25.0		25.0	25.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	5.0			5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	14.0	14.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	10	10	10		10	10
Act Effct Green (s)	12.2	12.2	20.2			20.2
Actuated g/C Ratio	0.29	0.29	0.48			0.48
v/c Ratio	0.15	0.58	0.31			0.38

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	11.5	7.8	7.8			9.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	11.5	7.8	7.8			9.5
LOS	B	A	A			A
Approach Delay	8.4		7.8			9.5
Approach LOS	A		A			A
Queue Length 50th (m)	4.1	5.1	8.6			7.9
Queue Length 95th (m)	10.2	19.0	26.1			25.2
Internal Link Dist (m)	275.7		187.2			662.4
Turn Bay Length (m)						
Base Capacity (vph)	1014	997	1989			1313
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.07	0.36	0.25			0.30

Intersection Summary		
Cycle Length: 60		
Actuated Cycle Length: 42.5		
Natural Cycle: 55		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.58		
Intersection Signal Delay: 8.5		Intersection LOS: A
Intersection Capacity Utilization 57.0%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 4: 12 Mile Coulee Rd NW & Tuscany Wy NW



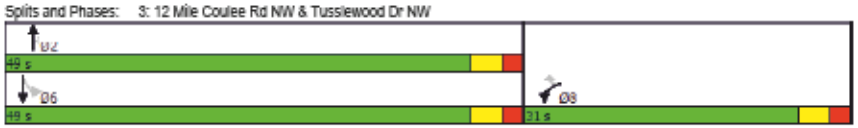
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	52	310	525	32	320	848
Future Volume (vph)	52	310	525	32	320	848
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.96		1.00
Frt		0.850		0.850		
Flt Protected	0.950					0.986
Satd. Flow (prot)	1704	1525	3408	1525	0	3360
Flt Permitted	0.950					0.680
Satd. Flow (perm)	1688	1487	3408	1466	0	2313
Satd. Flow (RTOR)		281		34		
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	55	326	553	34	337	893
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	326	553	34	0	1230
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	31.0	31.0	49.0	49.0	49.0	49.0
Total Split (%)	38.8%	38.8%	61.3%	61.3%	61.3%	61.3%
Maximum Green (s)	26.0	26.0	44.0	44.0	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	Min	Min
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	10	10	10	10	10	10
Act Effct Green (s)	12.9	12.9	42.2	42.2		42.2
Actuated g/C Ratio	0.20	0.20	0.65	0.65		0.65
v/c Ratio	0.16	0.63	0.25	0.04		0.82

3: 12 Mile Coulee Rd NW & Tusslewood Dr NW
03-13-2020
PM Peak Hour
Background 2028_imp

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	22.8	10.9	6.0	2.8		16.7
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	22.8	10.9	6.0	2.8		16.7
LOS	C	B	A	A		B
Approach Delay	12.6		5.8			16.7
Approach LOS	B		A			B
Queue Length 50th (m)	6.1	5.0	10.8	0.0		43.2
Queue Length 95th (m)	14.2	24.6	32.7	3.7		#145.6
Internal Link Dist (m)	383.0		662.4			60.3
Turn Bay Length (m)	30.0			15.0		
Base Capacity (vph)	668	767	2329	1012		1560
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	0.08	0.43	0.24	0.03		0.78

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 65.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 76.3%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: 12 Mile Coulee Rd NW & Tusslewood Dr NW



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Synchro 9
RSJ

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	313	210	347	152	390	470
Future Volume (vph)	313	210	347	152	390	470
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.99	0.98	0.99			1.00
Frt		0.850	0.954			
Flt Protected	0.950					0.978
Satd. Flow (prot)	1704	1525	3213	0	0	3333
Flt Permitted	0.950					0.636
Satd. Flow (perm)	1689	1488	3213	0	0	2160
Satd. Flow (RTOR)		221	160			
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	329	221	365	160	411	495
Shared Lane Traffic (%)						
Lane Group Flow (vph)	329	221	525	0	0	906
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	25.0	25.0	25.0		27.0	27.0
Total Split (s)	25.0	25.0	35.0		35.0	35.0
Total Split (%)	41.7%	41.7%	58.3%		58.3%	58.3%
Maximum Green (s)	20.0	20.0	30.0		30.0	30.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	5.0			5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	12.0	12.0	12.0		14.0	14.0
Pedestrian Calls (#/hr)	10	10	10		10	10
Act Effct Green (s)	14.9	14.9	25.9			25.9
Actuated g/C Ratio	0.29	0.29	0.51			0.51
v/c Ratio	0.66	0.37	0.31			0.99dl

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	23.7	4.7	5.8			20.0
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	23.7	4.7	5.8			20.0
LOS	C	A	A			B
Approach Delay	16.1		5.8			20.0
Approach LOS	B		A			B
Queue Length 50th (m)	29.5	0.0	9.3			35.4
Queue Length 95th (m)	54.2	12.4	19.6			#81.4
Internal Link Dist (m)	275.7		187.2			662.4
Turn Bay Length (m)						
Base Capacity (vph)	684	729	1998			1301
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.48	0.30	0.26			0.70

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 72.0%	ICU Level of Service C
Analysis Period (min) 15	

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

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 4: 12 Mile Coulee Rd NW & Tuscany Wy NW

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	2190	161	334	880	250	146	237	734	620	125	100
Future Volume (vph)	110	2190	161	334	880	250	146	237	734	620	125	100
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.97	1.00		0.97	0.99		0.98	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3306	3408	1525	3211	3310	1481	1704	3408	1525	3273	3375	1525
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3284	3408	1479	3208	3310	1437	1690	3408	1500	3252	3375	1500
Satd. Flow (RTOR)			155			266			383			218
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	117	2330	171	355	936	266	155	252	781	660	134	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	2330	171	355	936	266	155	252	781	660	134	106
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	27.0	27.0	7.0	27.0	27.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	13.0	34.5	34.5	13.0	34.5	34.5	11.0	17.5		11.0	17.5	
Total Split (s)	21.0	47.5	47.5	21.0	47.5	47.5	14.0	27.5		34.0	47.5	
Total Split (%)	16.2%	36.5%	36.5%	16.2%	36.5%	36.5%	10.8%	21.2%		26.2%	36.5%	
Maximum Green (s)	15.0	40.0	40.0	15.0	40.0	40.0	10.0	20.0		30.0	40.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.0	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0		1.0	4.0	
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)	6.0	7.5	7.5	6.0	7.5	7.5	4.0	7.5		4.0	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		8.0	8.0		8.0	8.0		8.0			8.0	
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		33.0			33.0	
Pedestrian Calls (#/hr)		10	10		10	10		10			10	
Act Effct Green (s)	10.1	40.4	40.4	15.1	45.5	45.5	10.1	18.0	126.8	28.0	35.9	126.8
Actuated g/C Ratio	0.08	0.32	0.32	0.12	0.36	0.36	0.08	0.14	1.00	0.22	0.28	1.00
v/c Ratio	0.45	2.15	0.30	0.93	0.79	0.39	1.15	0.52	0.52	0.91	0.14	0.07

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	63.0	543.5	8.9	86.6	43.8	6.1	172.8	53.6	1.3	66.5	32.8	0.1
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	63.0	543.5	8.9	86.6	43.8	6.1	172.8	53.6	1.3	66.5	32.8	0.1
LOS	E	F	A	F	D	A	F	D	A	E	C	A
Approach Delay		487.1			47.1			34.8			53.7	
Approach LOS		F			D			C			D	
Queue Length 50th (m)	15.1	~501.5	2.8	47.2	111.2	0.0	~46.3	33.1	0.0	83.5	13.7	0.0
Queue Length 95th (m)	29.2	#686.1	23.6	#99.5	#211.0	23.3	#113.4	46.2	0.0	#152.8	21.3	0.0
Internal Link Dist (m)		391.1			381.1			416.2			342.9	
Turn Bay Length (m)	135.0		180.0	110.0		200.0	55.0		85.0	140.0		100.0
Base Capacity (vph)	394	1085	576	383	1186	685	135	637	1500	782	1169	1500
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	0.30	2.15	0.30	0.93	0.79	0.39	1.15	0.40	0.52	0.84	0.11	0.07

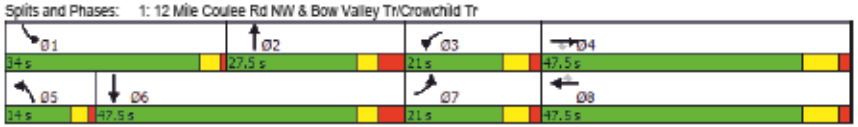
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 126.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.15
Intersection Signal Delay: 229.6 Intersection LOS: F
Intersection Capacity Utilization 126.6% 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: 1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	18	24	1083	603	18
Future Volume (Veh/h)	34	18	24	1083	603	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	36	19	26	1152	641	19
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				84		
pX, platoon unblocked	0.84					
vC, conflicting volume	1298	350	670			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	974	350	670			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	97	97			
cM capacity (veh/h)	200	636	909			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	55	410	768	427	233
Volume Left	36	26	0	0	0
Volume Right	19	0	0	0	19
cSH	262	909	1700	1700	1700
Volume to Capacity	0.21	0.03	0.45	0.25	0.14
Queue Length 95th (m)	6.2	0.7	0.0	0.0	0.0
Control Delay (s)	22.3	0.9	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	22.3	0.3		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay		0.8		
Intersection Capacity Utilization		61.3%	ICU Level of Service	B
Analysis Period (min)		15		

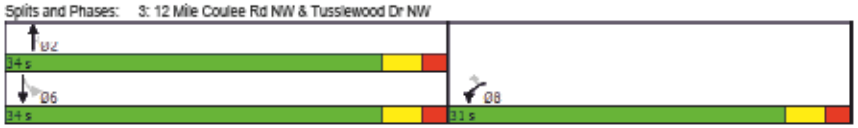
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	22	340	767	12	170	451
Future Volume (vph)	22	340	767	12	170	451
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.96		0.96		1.00
Frt		0.850		0.850		
Flt Protected	0.950					0.986
Satd. Flow (prot)	1687	1510	3408	1525	0	3290
Flt Permitted	0.950					0.600
Satd. Flow (perm)	1675	1476	3408	1469	0	2000
Satd. Flow (RTOR)		91		9		
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	2%	2%	2%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	23	362	816	13	181	480
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	362	816	13	0	661
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	31.0	31.0	34.0	34.0	34.0	34.0
Total Split (%)	47.7%	47.7%	52.3%	52.3%	52.3%	52.3%
Maximum Green (s)	26.0	26.0	29.0	29.0	29.0	29.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	Min	Min
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	10	10	10	10	10	10
Act Effct Green (s)	15.6	15.6	23.4	23.4		23.4
Actuated g/C Ratio	0.32	0.32	0.47	0.47		0.47
v/c Ratio	0.04	0.68	0.51	0.02		0.70

3: 12 Mile Coulee Rd NW & Tusslewood Dr NW
03-13-2020
AM Peak Hour
Background 2039

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	12.1	18.3	11.2	6.4		16.3
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	12.1	18.3	11.2	6.4		16.3
LOS	B	B	B	A		B
Approach Delay	17.9		11.1			16.3
Approach LOS	B		B			B
Queue Length 50th (m)	1.3	18.1	23.3	0.2		21.5
Queue Length 95th (m)	5.7	49.3	53.3	2.9		55.0
Internal Link Dist (m)	383.0		662.4			60.3
Turn Bay Length (m)	30.0			15.0		
Base Capacity (vph)	920	847	2074	897		1217
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	0.03	0.43	0.39	0.01		0.54

Intersection Summary			
Cycle Length: 65			
Actuated Cycle Length: 49.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: 12 Mile Coulee Rd NW & Tusslewood Dr NW



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Synchro 9
RSJ

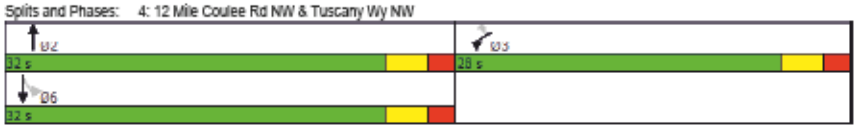
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	70	360	419	76	220	223
Future Volume (vph)	70	360	419	76	220	223
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.99	0.96	0.99			1.00
Frt		0.850	0.977			
Flt Protected	0.950					0.976
Satd. Flow (prot)	1704	1525	3310	0	0	3294
Flt Permitted	0.950					0.630
Satd. Flow (perm)	1690	1490	3310	0	0	2119
Satd. Flow (RTOR)		284	45			
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	74	383	446	81	234	237
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	383	527	0	0	471
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	
Detector Phase	3	3	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	27.0	27.0	25.0		25.0	25.0
Total Split (s)	28.0	28.0	32.0		32.0	32.0
Total Split (%)	46.7%	46.7%	53.3%		53.3%	53.3%
Maximum Green (s)	23.0	23.0	27.0		27.0	27.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	5.0			5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	14.0	14.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	10	10	10		10	10
Act Effct Green (s)	12.2	12.2	20.7			20.7
Actuated g/C Ratio	0.28	0.28	0.48			0.48
v/c Ratio	0.15	0.61	0.33			0.46

4: 12 Mile Coulee Rd NW & Tuscany Wy NW
03-20-2020
AM Peak Hour
Background 2039

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	12.0	8.5	7.7			10.3
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	12.0	8.5	7.7			10.3
LOS	B	A	A			B
Approach Delay	9.1		7.7			10.3
Approach LOS	A		A			B
Queue Length 50th (m)	4.1	5.7	9.2			9.9
Queue Length 95th (m)	11.1	22.6	27.4			30.7
Internal Link Dist (m)	275.7		187.2			662.4
Turn Bay Length (m)						
Base Capacity (vph)	923	937	2121			1347
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.08	0.41	0.25			0.35

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 57.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: 12 Mile Coulee Rd NW & Tuscany Wy NW



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Synchro 9
RSJ

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	5	5	486	280	13
Future Volume (Veh/h)	9	5	5	486	280	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	10	5	5	517	298	14
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					211	
pX, platoon unblocked						
vC, conflicting volume	594	176	322			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	594	176	322			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	428	823	1225			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	177	345	199	113
Volume Left	10	5	0	0	0
Volume Right	5	0	0	0	14
cSH	509	1225	1700	1700	1700
Volume to Capacity	0.03	0.00	0.20	0.12	0.07
Queue Length 95th (m)	0.7	0.1	0.0	0.0	0.0
Control Delay (s)	12.3	0.3	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	12.3	0.1		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		30.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	1300	255	748	2030	1000	203	264	418	340	355	260
Future Volume (vph)	190	1300	255	748	2030	1000	203	264	418	340	355	260
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3306	3375	1525	3306	3408	1525	1704	3408	1525	3306	3408	1525
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3302	3375	1481	3295	3408	1483	1696	3408	1500	3287	3408	1500
Satd. Flow (RTOR)			258			354			440			312
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	200	1368	268	787	2137	1053	214	278	440	358	374	295
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	1368	268	787	2137	1053	214	278	440	358	374	295
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	27.0	27.0	7.0	27.0	27.0	7.0	10.0		7.0	1.0	
Minimum Split (s)	13.0	34.5	34.5	13.0	34.5	34.5	11.0	17.5		11.0	17.5	
Total Split (s)	21.0	37.5	37.5	28.0	44.5	44.5	14.0	27.5		19.0	32.5	
Total Split (%)	18.8%	33.5%	33.5%	25.0%	39.7%	39.7%	12.5%	24.6%		17.0%	29.0%	
Maximum Green (s)	15.0	30.0	30.0	22.0	37.0	37.0	10.0	20.0		15.0	25.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.0	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0		1.0	4.0	
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)	6.0	7.5	7.5	6.0	7.5	7.5	4.0	7.5		4.0	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		8.0	8.0		8.0	8.0		8.0			8.0	
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		33.0			33.0	
Pedestrian Calls (#/hr)		10	10		10	10		10			10	
Act Effct Green (s)	11.5	30.3	30.3	22.2	41.0	41.0	10.1	17.5	109.9	14.5	22.0	109.9
Actuated g/C Ratio	0.10	0.28	0.28	0.20	0.37	0.37	0.09	0.16	1.00	0.13	0.20	1.00
v/c Ratio	0.58	1.47	0.45	1.18	1.68	1.36	1.37	0.51	0.29	0.82	0.55	0.20

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	55.2	248.7	7.1	134.2	335.9	191.3	240.4	44.6	0.5	63.4	41.6	0.3
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	55.2	248.7	7.1	134.2	335.9	191.3	240.4	44.6	0.5	63.4	41.6	0.3
LOS	E	F	A	F	F	F	F	D	A	E	D	A
Approach Delay		192.4			257.7			68.7			37.3	
Approach LOS		F			F			E			D	
Queue Length 50th (m)	21.4	~211.5	0.0	~103.2	~353.6	~249.6	~60.3	30.4	0.0	38.9	39.8	0.0
Queue Length 95th (m)	40.6	#343.0	23.7	#192.3	#545.1	#424.7	#138.2	42.9	0.0	#83.2	53.6	0.0
Internal Link Dist (m)		391.1			381.1			416.2			342.9	
Turn Bay Length (m)	135.0		180.0	110.0		200.0	55.0		85.0	140.0		100.0
Base Capacity (vph)	455	930	602	668	1272	775	156	734	1500	455	891	1500
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	1.47	0.45	1.18	1.68	1.36	1.37	0.38	0.29	0.79	0.42	0.20

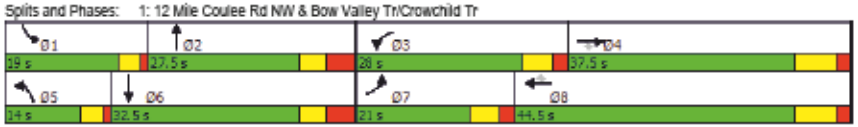
Intersection Summary

Cycle Length: 112
Actuated Cycle Length: 109.9
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.68
Intersection Signal Delay: 190.5 Intersection LOS: F
Intersection Capacity Utilization 112.8% 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: 1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	5	5	865	1304	54
Future Volume (Veh/h)	20	5	5	865	1304	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	5	5	911	1373	57
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				84		
pX, platoon unblocked	0.93					
vC, conflicting volume	1887	735	1440			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1807	735	1440			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	67	99	99			
cM capacity (veh/h)	64	356	463			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	309	607	915	515
Volume Left	21	5	0	0	0
Volume Right	5	0	0	0	57
cSH	76	463	1700	1700	1700
Volume to Capacity	0.34	0.01	0.36	0.54	0.30
Queue Length 95th (m)	10.4	0.3	0.0	0.0	0.0
Control Delay (s)	75.5	0.4	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	75.5	0.1		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		51.7%	ICU Level of Service	A
Analysis Period (min)		15		

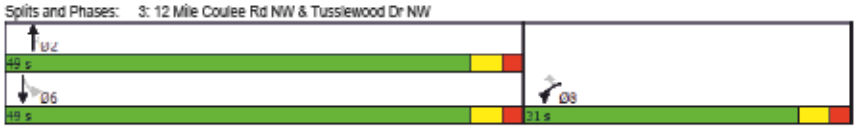
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	52	290	575	32	380	928
Future Volume (vph)	52	290	575	32	380	928
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.96		1.00
Frt		0.850		0.850		
Flt Protected	0.950					0.986
Satd. Flow (prot)	1704	1525	3408	1525	0	3360
Flt Permitted	0.950					0.658
Satd. Flow (perm)	1688	1487	3408	1466	0	2238
Satd. Flow (RTOR)		248		31		
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	55	305	605	34	400	977
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	305	605	34	0	1377
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	31.0	31.0	49.0	49.0	49.0	49.0
Total Split (%)	38.8%	38.8%	61.3%	61.3%	61.3%	61.3%
Maximum Green (s)	26.0	26.0	44.0	44.0	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	Min	Min
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	10	10	10	10	10	10
Act Effct Green (s)	13.1	13.1	44.4	44.4		44.4
Actuated g/C Ratio	0.19	0.19	0.66	0.66		0.66
v/c Ratio	0.17	0.63	0.27	0.03		0.94

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	22.9	12.0	6.0	3.0		26.1
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	22.9	12.0	6.0	3.0		26.1
LOS	C	B	A	A		C
Approach Delay	13.6		5.9			26.1
Approach LOS	B		A			C
Queue Length 50th (m)	6.1	6.3	12.0	0.1		58.5
Queue Length 95th (m)	14.2	25.9	36.0	4.0		#176.4
Internal Link Dist (m)	383.0		662.4			60.3
Turn Bay Length (m)	30.0			15.0		
Base Capacity (vph)	661	729	2240	974		1470
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	0.08	0.42	0.27	0.03		0.94

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 67.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 80.4%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 3: 12 Mile Coulee Rd NW & Tusslewood Dr NW



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	263	240	357	162	400	540
Future Volume (vph)	263	240	357	162	400	540
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.99	0.98	0.99			1.00
Frt		0.850	0.953			
Flt Protected	0.950					0.979
Satd. Flow (prot)	1704	1525	3209	0	0	3336
Flt Permitted	0.950					0.636
Satd. Flow (perm)	1689	1488	3209	0	0	2161
Satd. Flow (RTOR)		253	171			
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	277	253	376	171	421	568
Shared Lane Traffic (%)						
Lane Group Flow (vph)	277	253	547	0	0	989
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	25.0	25.0	25.0		27.0	27.0
Total Split (s)	25.0	25.0	35.0		35.0	35.0
Total Split (%)	41.7%	41.7%	58.3%		58.3%	58.3%
Maximum Green (s)	20.0	20.0	30.0		30.0	30.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	5.0			5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	12.0	12.0	12.0		14.0	14.0
Pedestrian Calls (#/hr)	10	10	10		10	10
Act Effct Green (s)	14.0	14.0	27.4			27.4
Actuated g/C Ratio	0.27	0.27	0.53			0.53
v/c Ratio	0.60	0.43	0.31			0.99dl

4: 12 Mile Coulee Rd NW & Tuscany Wy NW
03-20-2020

PM Peak Hour
Background 2039

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	23.0	5.1	5.4			21.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	23.0	5.1	5.4			21.6
LOS	C	A	A			C
Approach Delay	14.5		5.4			21.6
Approach LOS	B		A			C
Queue Length 50th (m)	25.0	0.0	8.7			37.4
Queue Length 95th (m)	44.8	13.3	20.3			#93.2
Internal Link Dist (m)	275.7		187.2			662.4
Turn Bay Length (m)						
Base Capacity (vph)	674	741	1974			1282
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.41	0.34	0.28			0.77

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 51.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 4: 12 Mile Coulee Rd NW & Tuscany Wy NW

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	5	5	507	792	11
Future Volume (Veh/h)	12	5	5	507	792	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	5	5	534	834	12
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					211	
pX, platoon unblocked						
vC, conflicting volume	1137	443	856			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1137	443	856			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	99	99			
cM capacity (veh/h)	191	553	774			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	18	183	356	556	290
Volume Left	13	5	0	0	0
Volume Right	5	0	0	0	12
cSH	233	774	1700	1700	1700
Volume to Capacity	0.08	0.01	0.21	0.33	0.17
Queue Length 95th (m)	2.0	0.2	0.0	0.0	0.0
Control Delay (s)	21.7	0.3	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	21.7	0.1		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		35.7%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1470	122	292	790	210	128	231	751	600	128	100
Future Volume (vph)	50	1470	122	292	790	210	128	231	751	600	128	100
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.97	1.00		0.97	0.99		0.98	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3306	3408	1525	3181	3279	1467	1704	3408	1525	3273	3375	1525
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	3408	1479	3172	3279	1423	1690	3408	1500	3251	3375	1500
Satd. Flow (RTOR)			155			223			384			218
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	6%	6%	6%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	53	1564	130	311	840	223	136	245	799	638	136	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	1564	130	311	840	223	136	245	799	638	136	106
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	27.0	27.0	7.0	27.0	27.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	13.0	34.5	34.5	13.0	34.5	34.5	11.0	17.5		11.0	17.5	
Total Split (s)	21.0	47.5	47.5	21.0	47.5	47.5	14.0	27.5		34.0	47.5	
Total Split (%)	16.2%	36.5%	36.5%	16.2%	36.5%	36.5%	10.8%	21.2%		26.2%	36.5%	
Maximum Green (s)	15.0	40.0	40.0	15.0	40.0	40.0	10.0	20.0		30.0	40.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.0	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0		1.0	4.0	
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)	6.0	7.5	7.5	6.0	7.5	7.5	4.0	7.5		4.0	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		8.0	8.0		8.0	8.0		8.0			8.0	
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		33.0			33.0	
Pedestrian Calls (#/hr)		10	10		10	10		10			10	
Act Effct Green (s)	7.9	40.5	40.5	14.6	50.2	50.2	10.1	17.8	125.5	27.3	35.0	125.5
Actuated g/C Ratio	0.06	0.32	0.32	0.12	0.40	0.40	0.08	0.14	1.00	0.22	0.28	1.00
v/c Ratio	0.25	1.42	0.22	0.84	0.64	0.32	0.99	0.51	0.53	0.89	0.14	0.07

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	62.9	229.2	4.3	75.4	36.5	5.6	133.9	53.0	1.4	64.4	33.0	0.1
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	62.9	229.2	4.3	75.4	36.5	5.6	133.9	53.0	1.4	64.4	33.0	0.1
LOS	E	F	A	E	D	A	F	D	A	E	C	A
Approach Delay		207.4			40.3			27.4			51.8	
Approach LOS		F			D			C			D	
Queue Length 50th (m)	6.8	~283.0	0.0	40.5	92.3	0.0	35.3	32.0	0.0	80.0	13.9	0.0
Queue Length 95th (m)	15.9	#427.4	10.9	#84.2	160.0	20.6	#98.4	45.2	0.0	#145.5	21.6	0.0
Internal Link Dist (m)		391.1			381.1			416.2			342.9	
Turn Bay Length (m)	135.0		180.0	110.0		200.0	55.0		85.0	140.0		100.0
Base Capacity (vph)	399	1099	581	384	1310	702	137	644	1500	791	1182	1500
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	0.13	1.42	0.22	0.81	0.64	0.32	0.99	0.38	0.53	0.81	0.12	0.07

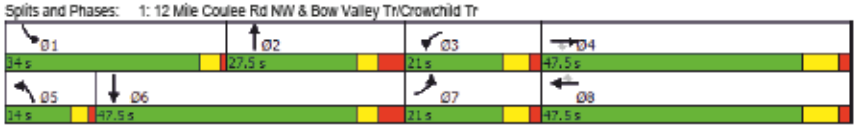
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 125.5
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 95.6 Intersection LOS: F
Intersection Capacity Utilization 104.4% 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.

Splits and Phases: 1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	24	18	24	1086	534	8
Future Volume (Veh/h)	24	18	24	1086	534	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	26	19	26	1155	568	9
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				84		
pX, platoon unblocked	0.84					
vC, conflicting volume	1222	306	587			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	877	306	587			
tC, single (s)	6.9	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	97			
cM capacity (veh/h)	229	676	976			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	45	411	770	379	198
Volume Left	26	26	0	0	0
Volume Right	19	0	0	0	9
cSH	318	976	1700	1700	1700
Volume to Capacity	0.14	0.03	0.45	0.22	0.12
Queue Length 95th (m)	3.9	0.7	0.0	0.0	0.0
Control Delay (s)	18.2	0.8	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	18.2	0.3		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		61.3%	ICU Level of Service	B
Analysis Period (min)		15		

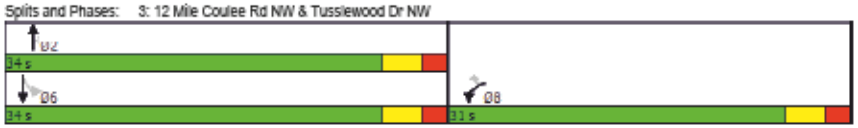
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	23	340	770	14	160	392
Future Volume (vph)	23	340	770	14	160	392
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.96		0.96		1.00
Frt		0.850		0.850		
Flt Protected	0.950					0.986
Satd. Flow (prot)	1704	1525	3408	1525	0	3269
Flt Permitted	0.950					0.595
Satd. Flow (perm)	1691	1491	3408	1469	0	1971
Satd. Flow (RTOR)		90		10		
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	24	362	819	15	170	417
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	362	819	15	0	587
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	31.0	31.0	34.0	34.0	34.0	34.0
Total Split (%)	47.7%	47.7%	52.3%	52.3%	52.3%	52.3%
Maximum Green (s)	26.0	26.0	29.0	29.0	29.0	29.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	Min	Min
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	10	10	10	10	10	10
Act Effct Green (s)	15.2	15.2	22.6	22.6		22.6
Actuated g/C Ratio	0.32	0.32	0.47	0.47		0.47
v/c Ratio	0.04	0.68	0.51	0.02		0.63

3: 12 Mile Coulee Rd NW & Tusslewood Dr NW
03-16-2020
AM Peak Hour
After Development 2028

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	11.7	17.8	11.2	6.5		14.7
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	11.7	17.8	11.2	6.5		14.7
LOS	B	B	B	A		B
Approach Delay	17.4		11.1			14.7
Approach LOS	B		B			B
Queue Length 50th (m)	1.3	17.8	22.2	0.3		17.3
Queue Length 95th (m)	5.8	49.2	53.4	3.2		46.8
Internal Link Dist (m)	383.0		662.4			60.3
Turn Bay Length (m)	30.0			15.0		
Base Capacity (vph)	951	872	2122	918		1227
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	0.03	0.42	0.39	0.02		0.48

Intersection Summary		
Cycle Length: 65		
Actuated Cycle Length: 48.1		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.68		
Intersection Signal Delay: 13.6		Intersection LOS: B
Intersection Capacity Utilization 63.1%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 3: 12 Mile Coulee Rd NW & Tusslewood Dr NW



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Synchro 9
RSJ

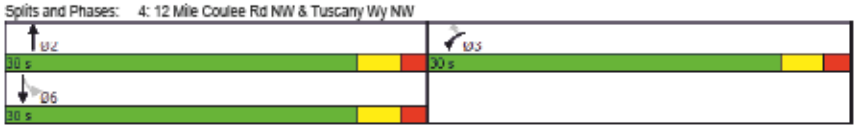
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	73	340	433	70	160	235
Future Volume (vph)	73	340	433	70	160	235
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.99	0.98	0.99			1.00
Frt		0.850	0.979			
Flt Protected	0.950					0.980
Satd. Flow (prot)	1704	1525	3318	0	0	3301
Flt Permitted	0.950					0.652
Satd. Flow (perm)	1690	1490	3318	0	0	2190
Satd. Flow (RTOR)		242	37			
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	78	362	461	74	170	250
Shared Lane Traffic (%)						
Lane Group Flow (vph)	78	362	535	0	0	420
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	
Detector Phase	3	3	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	27.0	27.0	25.0		25.0	25.0
Total Split (s)	30.0	30.0	30.0		30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%		50.0%	50.0%
Maximum Green (s)	25.0	25.0	25.0		25.0	25.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	5.0			5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	14.0	14.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	10	10	10		10	10
Act Effct Green (s)	12.4	12.4	20.2			20.2
Actuated g/C Ratio	0.29	0.29	0.47			0.47
v/c Ratio	0.16	0.60	0.34			0.41

4: 12 Mile Coulee Rd NW & Tuscany Wy NW
03-20-2020
AM Peak Hour
After Development 2028

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	11.5	9.1	8.1			9.9
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	11.5	9.1	8.1			9.9
LOS	B	A	A			A
Approach Delay	9.5		8.1			9.9
Approach LOS	A		A			A
Queue Length 50th (m)	4.4	7.0	9.5			8.5
Queue Length 95th (m)	10.7	22.1	28.5			27.0
Internal Link Dist (m)	275.7		187.2			662.4
Turn Bay Length (m)						
Base Capacity (vph)	1009	981	1980			1296
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.08	0.37	0.27			0.32

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 42.7	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 57.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: 12 Mile Coulee Rd NW & Tuscany Wy NW



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Synchro 9
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	5	5	456	270	38
Future Volume (Veh/h)	47	5	5	456	270	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	50	5	5	485	287	40
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					211	
pX, platoon unblocked						
vC, conflicting volume	580	184	337			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	580	184	337			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	99	100			
cM capacity (veh/h)	436	814	1209			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	55	167	323	191	136
Volume Left	50	5	0	0	0
Volume Right	5	0	0	0	40
cSH	456	1209	1700	1700	1700
Volume to Capacity	0.12	0.00	0.19	0.11	0.08
Queue Length 95th (m)	3.3	0.1	0.0	0.0	0.0
Control Delay (s)	14.0	0.3	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	14.0	0.1		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		29.4%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	1050	238	663	1520	740	194	270	427	260	361	220
Future Volume (vph)	200	1050	238	663	1520	740	194	270	427	260	361	220
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3306	3408	1525	3306	3408	1525	1704	3408	1525	3306	3408	1525
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3298	3408	1481	3291	3408	1483	1696	3408	1500	3287	3408	1500
Satd. Flow (RTOR)			251			347			449			312
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	211	1105	251	698	1600	779	204	284	449	274	380	232
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	1105	251	698	1600	779	204	284	449	274	380	232
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	27.0	27.0	7.0	27.0	27.0	7.0	10.0		7.0	1.0	
Minimum Split (s)	13.0	34.5	34.5	13.0	34.5	34.5	11.0	17.5		11.0	17.5	
Total Split (s)	21.0	37.5	37.5	28.0	44.5	44.5	14.0	27.5		19.0	32.5	
Total Split (%)	18.8%	33.5%	33.5%	25.0%	39.7%	39.7%	12.5%	24.6%		17.0%	29.0%	
Maximum Green (s)	15.0	30.0	30.0	22.0	37.0	37.0	10.0	20.0		15.0	25.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.0	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0		1.0	4.0	
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)	6.0	7.5	7.5	6.0	7.5	7.5	4.0	7.5		4.0	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		8.0	8.0		8.0	8.0		8.0			8.0	
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		33.0			33.0	
Pedestrian Calls (#/hr)		10	10		10	10		10			10	
Act Effct Green (s)	11.7	30.3	30.3	22.2	40.8	40.8	10.1	18.2	109.2	13.1	21.3	109.2
Actuated g/C Ratio	0.11	0.28	0.28	0.20	0.37	0.37	0.09	0.17	1.00	0.12	0.20	1.00
v/c Ratio	0.59	1.17	0.42	1.04	1.26	1.01	1.30	0.50	0.30	0.69	0.57	0.15

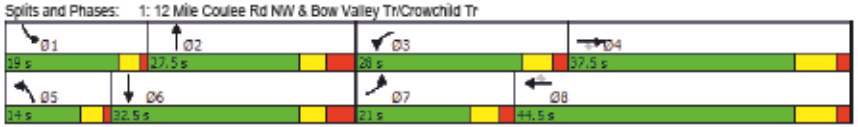
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	55.1	123.4	7.1	88.0	153.1	55.6	213.1	43.7	0.5	57.0	42.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	123.4	7.1	88.0	153.1	55.6	213.1	43.7	0.5	57.0	42.3	0.2
LOS	E	F	A	F	F	E	F	D	A	E	D	A
Approach Delay		95.6			113.6			59.9			35.8	
Approach LOS		F			F			E			D	
Queue Length 50th (m)	22.4	~145.3	0.0	~78.2	~223.2	109.0	~54.9	30.7	0.0	29.0	40.5	0.0
Queue Length 95th (m)	42.6	#261.3	23.0	#165.1	#384.5	#263.4	#131.3	43.6	0.0	#54.2	54.4	0.0
Internal Link Dist (m)		391.1			381.1			416.2			342.9	
Turn Bay Length (m)	135.0		180.0	110.0		200.0	55.0		85.0	140.0		100.0
Base Capacity (vph)	458	945	592	673	1274	771	157	738	1500	458	896	1500
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	0.46	1.17	0.42	1.04	1.26	1.01	1.30	0.38	0.30	0.60	0.42	0.15

Intersection Summary		
Cycle Length: 112		
Actuated Cycle Length: 109.2		
Natural Cycle: 110		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.30		
Intersection Signal Delay: 90.8	Intersection LOS: F	
Intersection Capacity Utilization 98.1%	ICU Level of Service F	
Analysis Period (min) 15		

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

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

Splits and Phases: 1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	5	5	871	1208	54
Future Volume (Veh/h)	20	5	5	871	1208	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	5	5	917	1272	57
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				84		
pX, platoon unblocked	0.94					
vC, conflicting volume	1789	684	1339			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1705	684	1339			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	72	99	99			
cM capacity (veh/h)	75	385	507			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	311	611	848	481
Volume Left	21	5	0	0	0
Volume Right	5	0	0	0	57
cSH	89	507	1700	1700	1700
Volume to Capacity	0.29	0.01	0.36	0.50	0.28
Queue Length 95th (m)	8.7	0.2	0.0	0.0	0.0
Control Delay (s)	61.5	0.3	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	61.5	0.1		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		48.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	54	310	561	34	320	892
Future Volume (vph)	54	310	561	34	320	892
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.96		1.00
Frt		0.850		0.850		
Flt Protected	0.950					0.987
Satd. Flow (prot)	1704	1525	3408	1525	0	3363
Flt Permitted	0.950					0.673
Satd. Flow (perm)	1688	1487	3408	1466	0	2290
Satd. Flow (RTOR)		257		33		
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	57	326	591	36	337	939
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	326	591	36	0	1276
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	31.0	31.0	49.0	49.0	49.0	49.0
Total Split (%)	38.8%	38.8%	61.3%	61.3%	61.3%	61.3%
Maximum Green (s)	26.0	26.0	44.0	44.0	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	Min	Min
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	10	10	10	10	10	10
Act Effct Green (s)	13.2	13.2	44.3	44.3		44.3
Actuated g/C Ratio	0.20	0.20	0.66	0.66		0.66
v/c Ratio	0.17	0.66	0.26	0.04		0.85

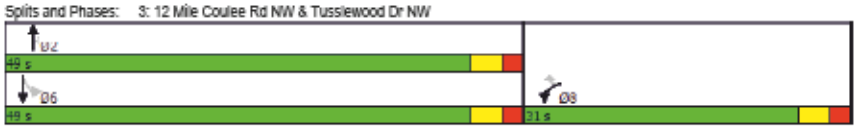
3: 12 Mile Coulee Rd NW & Tusslewood Dr NW
03-16-2020

PM Peak Hour
After Development 2028

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	22.9	12.9	6.1	3.0		18.3
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	22.9	12.9	6.1	3.0		18.3
LOS	C	B	A	A		B
Approach Delay	14.4		5.9			18.3
Approach LOS	B		A			B
Queue Length 50th (m)	6.3	7.7	11.7	0.1		47.3
Queue Length 95th (m)	14.5	28.8	35.1	4.1		#155.3
Internal Link Dist (m)	383.0		662.4			60.3
Turn Bay Length (m)	30.0			15.0		
Base Capacity (vph)	660	733	2234	972		1501
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	0.09	0.44	0.26	0.04		0.85

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 67.6	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 77.6%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: 12 Mile Coulee Rd NW & Tusslewood Dr NW



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Synchro 9

RSJ

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	318	210	385	157	390	516
Future Volume (vph)	318	210	385	157	390	516
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.99	0.98	0.99			1.00
Frt		0.850	0.957			
Flt Protected	0.950					0.979
Satd. Flow (prot)	1704	1525	3225	0	0	3336
Flt Permitted	0.950					0.629
Satd. Flow (perm)	1689	1488	3225	0	0	2137
Satd. Flow (RTOR)		221	147			
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	335	221	405	165	411	543
Shared Lane Traffic (%)						
Lane Group Flow (vph)	335	221	570	0	0	954
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	25.0	25.0	25.0		27.0	27.0
Total Split (s)	25.0	25.0	35.0		35.0	35.0
Total Split (%)	41.7%	41.7%	58.3%		58.3%	58.3%
Maximum Green (s)	20.0	20.0	30.0		30.0	30.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	5.0			5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	12.0	12.0	12.0		14.0	14.0
Pedestrian Calls (#/hr)	10	10	10		10	10
Act Effct Green (s)	15.2	15.2	27.3			27.3
Actuated g/C Ratio	0.29	0.29	0.52			0.52
v/c Ratio	0.68	0.38	0.33			1.02dl

4: 12 Mile Coulee Rd NW & Tuscany Wy NW
03-20-2020

PM Peak Hour
After Development 2028

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	25.0	4.8	6.3			22.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	25.0	4.8	6.3			22.6
LOS	C	A	A			C
Approach Delay	17.0		6.3			22.6
Approach LOS	B		A			C
Queue Length 50th (m)	31.5	0.0	11.1			39.5
Queue Length 95th (m)	55.3	12.4	22.4			#89.0
Internal Link Dist (m)	275.7		187.2			662.4
Turn Bay Length (m)						
Base Capacity (vph)	660	712	1937			1242
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.51	0.31	0.29			0.77

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 73.5%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 4: 12 Mile Coulee Rd NW & Tuscany Wy NW

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	5	5	487	772	62
Future Volume (Veh/h)	55	5	5	487	772	62
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	5	5	513	813	65
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					211	
pX, platoon unblocked						
vC, conflicting volume	1132	459	888			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1132	459	888			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	70	99	99			
cM capacity (veh/h)	192	540	752			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	63	176	342	542	336
Volume Left	58	5	0	0	0
Volume Right	5	0	0	0	65
cSH	203	752	1700	1700	1700
Volume to Capacity	0.31	0.01	0.20	0.32	0.20
Queue Length 95th (m)	10.1	0.2	0.0	0.0	0.0
Control Delay (s)	30.6	0.3	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	30.6	0.1		0.0	
Approach LOS	D				

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	37.0%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	2190	162	352	880	250	148	241	761	620	128	100
Future Volume (vph)	110	2190	162	352	880	250	148	241	761	620	128	100
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.97	1.00		0.97	0.99		0.98	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3306	3408	1525	3181	3279	1467	1704	3408	1525	3273	3375	1525
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3284	3408	1479	3178	3279	1423	1690	3408	1500	3252	3375	1500
Satd. Flow (RTOR)			155			266			383			218
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	6%	6%	6%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	117	2330	172	374	936	266	157	256	810	660	136	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	2330	172	374	936	266	157	256	810	660	136	106
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	27.0	27.0	7.0	27.0	27.0	7.0	10.0		7.0	10.0	
Minimum Split (s)	13.0	34.5	34.5	13.0	34.5	34.5	11.0	17.5		11.0	17.5	
Total Split (s)	21.0	47.5	47.5	21.0	47.5	47.5	14.0	27.5		34.0	47.5	
Total Split (%)	16.2%	36.5%	36.5%	16.2%	36.5%	36.5%	10.8%	21.2%		26.2%	36.5%	
Maximum Green (s)	15.0	40.0	40.0	15.0	40.0	40.0	10.0	20.0		30.0	40.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.0	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0		1.0	4.0	
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)	6.0	7.5	7.5	6.0	7.5	7.5	4.0	7.5		4.0	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		8.0	8.0		8.0	8.0		8.0			8.0	
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		33.0			33.0	
Pedestrian Calls (#/hr)		10	10		10	10		10			10	
Act Effct Green (s)	10.1	40.4	40.4	15.1	45.4	45.4	10.1	18.1	126.9	28.0	36.0	126.9
Actuated g/C Ratio	0.08	0.32	0.32	0.12	0.36	0.36	0.08	0.14	1.00	0.22	0.28	1.00
v/c Ratio	0.44	2.15	0.30	0.99	0.80	0.39	1.16	0.53	0.54	0.91	0.14	0.07

1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr
03-16-2020
AM Peak Hour
After Development 2039

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	63.0	544.3	9.0	98.9	44.3	6.1	177.9	53.7	1.4	66.7	32.9	0.1
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	63.0	544.3	9.0	98.9	44.3	6.1	177.9	53.7	1.4	66.7	32.9	0.1
LOS	E	F	A	F	D	A	F	D	A	E	C	A
Approach Delay		487.7			50.8			35.0			53.8	
Approach LOS		F			D			D			D	
Queue Length 50th (m)	15.1	~502.6	3.0	50.2	112.1	0.0	~47.5	33.6	0.0	83.8	13.9	0.0
Queue Length 95th (m)	29.2	#686.1	23.9	#107.1	#212.4	23.3	#114.8	47.0	0.0	#152.8	21.6	0.0
Internal Link Dist (m)		391.1			381.1			416.2			342.9	
Turn Bay Length (m)	135.0		180.0	110.0		200.0	55.0		85.0	140.0		100.0
Base Capacity (vph)	394	1084	576	379	1174	680	135	637	1500	781	1168	1500
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	0.30	2.15	0.30	0.99	0.80	0.39	1.16	0.40	0.54	0.85	0.12	0.07

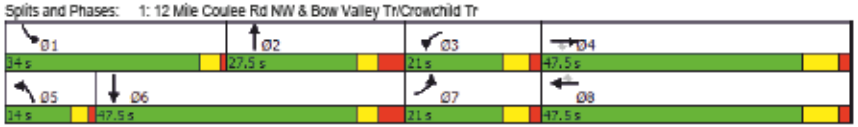
Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 126.9
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.15
Intersection Signal Delay: 229.2 — Intersection LOS: F
Intersection Capacity Utilization 127.1% — 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: 1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	18	24	1116	624	18
Future Volume (Veh/h)	34	18	24	1116	624	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	36	19	26	1187	664	19
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				84		
pX, platoon unblocked	0.83					
vC, conflicting volume	1339	362	693			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1001	362	693			
tC, single (s)	6.9	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	97	97			
cM capacity (veh/h)	189	625	891			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	55	422	791	443	240
Volume Left	36	26	0	0	0
Volume Right	19	0	0	0	19
cSH	249	891	1700	1700	1700
Volume to Capacity	0.22	0.03	0.47	0.26	0.14
Queue Length 95th (m)	6.6	0.7	0.0	0.0	0.0
Control Delay (s)	23.6	0.9	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	23.6	0.3		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		62.2%	ICU Level of Service	B
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	23	340	800	14	170	472
Future Volume (vph)	23	340	800	14	170	472
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.96		0.96		1.00
Frt		0.850		0.850		
Flt Protected	0.950					0.987
Satd. Flow (prot)	1704	1525	3408	1525	0	3269
Flt Permitted	0.950					0.592
Satd. Flow (perm)	1691	1491	3408	1469	0	1959
Satd. Flow (RTOR)		81		10		
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	24	362	851	15	181	502
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	362	851	15	0	683
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	31.0	31.0	34.0	34.0	34.0	34.0
Total Split (%)	47.7%	47.7%	52.3%	52.3%	52.3%	52.3%
Maximum Green (s)	26.0	26.0	29.0	29.0	29.0	29.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	Min	Min
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	10	10	10	10	10	10
Act Effct Green (s)	16.0	16.0	24.2	24.2		24.2
Actuated g/C Ratio	0.32	0.32	0.48	0.48		0.48
v/c Ratio	0.04	0.69	0.52	0.02		0.73

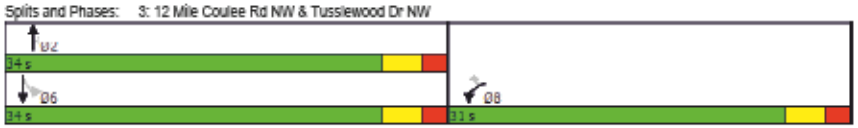
3: 12 Mile Coulee Rd NW & Tusslewood Dr NW
03-16-2020

AM Peak Hour
After Development 2039

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	12.6	19.3	11.4	6.4		17.7
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	12.6	19.3	11.4	6.4		17.7
LOS	B	B	B	A		B
Approach Delay	18.9		11.3			17.7
Approach LOS	B		B			B
Queue Length 50th (m)	1.4	20.6	25.8	0.3		23.9
Queue Length 95th (m)	5.8	50.5	56.0	3.2		#62.4
Internal Link Dist (m)	383.0		662.4			60.3
Turn Bay Length (m)	30.0			15.0		
Base Capacity (vph)	907	832	2025	876		1164
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	0.03	0.44	0.42	0.02		0.59

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 50.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 3: 12 Mile Coulee Rd NW & Tusslewood Dr NW



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Synchro 9

RSJ

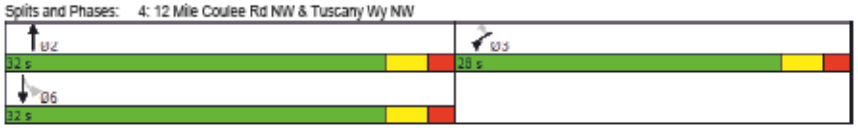
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	73	360	453	80	220	245
Future Volume (vph)	73	360	453	80	220	245
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.99	0.96	0.99			1.00
Frt		0.850	0.978			
Flt Protected	0.950					0.977
Satd. Flow (prot)	1704	1525	3313	0	0	3295
Flt Permitted	0.950					0.625
Satd. Flow (perm)	1690	1490	3313	0	0	2102
Satd. Flow (RTOR)		255	44			
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	78	383	482	85	234	261
Shared Lane Traffic (%)						
Lane Group Flow (vph)	78	383	567	0	0	495
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	3		2			6
Permitted Phases		3			6	
Detector Phase	3	3	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	27.0	27.0	25.0		25.0	25.0
Total Split (s)	28.0	28.0	32.0		32.0	32.0
Total Split (%)	46.7%	46.7%	53.3%		53.3%	53.3%
Maximum Green (s)	23.0	23.0	27.0		27.0	27.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	5.0			5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	14.0	14.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	10	10	10		10	10
Act Effct Green (s)	12.4	12.4	21.0			21.0
Actuated g/C Ratio	0.28	0.28	0.48			0.48
v/c Ratio	0.16	0.63	0.35			0.49

4: 12 Mile Coulee Rd NW & Tuscany Wy NW
03-20-2020
AM Peak Hour
After Development 2039

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	12.2	10.0	7.9			10.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	12.2	10.0	7.9			10.6
LOS	B	B	A			B
Approach Delay	10.4		7.9			10.6
Approach LOS	B		A			B
Queue Length 50th (m)	4.4	7.5	10.2			10.6
Queue Length 95th (m)	12.1	27.2	29.5			32.5
Internal Link Dist (m)	275.7		187.2			662.4
Turn Bay Length (m)						
Base Capacity (vph)	915	918	2105			1325
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.09	0.42	0.27			0.37

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 57.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: 12 Mile Coulee Rd NW & Tuscany Wy NW



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Synchro 9
RSJ

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	5	5	486	280	38
Future Volume (Veh/h)	47	5	5	486	280	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	50	5	5	517	298	40
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					211	
pX, platoon unblocked						
vC, conflicting volume	606	189	348			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	606	189	348			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	99	100			
cM capacity (veh/h)	420	808	1198			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	55	177	345	199	139
Volume Left	50	5	0	0	0
Volume Right	5	0	0	0	40
cSH	439	1198	1700	1700	1700
Volume to Capacity	0.13	0.00	0.20	0.12	0.08
Queue Length 95th (m)	3.4	0.1	0.0	0.0	0.0
Control Delay (s)	14.4	0.3	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	14.4	0.1		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		30.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	1300	258	783	2030	1000	204	270	447	340	361	280
Future Volume (vph)	190	1300	258	783	2030	1000	204	270	447	340	361	280
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3306	3408	1525	3306	3408	1525	1704	3408	1525	3306	3408	1525
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3302	3408	1481	3295	3408	1483	1696	3408	1500	3287	3408	1500
Satd. Flow (RTOR)			272			351			471			312
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Confl. Bikes (#/hr)			5			5			5			5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	200	1368	272	824	2137	1053	215	284	471	358	380	295
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	1368	272	824	2137	1053	215	284	471	358	380	295
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			Free
Detector Phase	7	4	4	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	27.0	27.0	7.0	27.0	27.0	7.0	10.0		7.0	1.0	
Minimum Split (s)	13.0	34.5	34.5	13.0	34.5	34.5	11.0	17.5		11.0	17.5	
Total Split (s)	21.0	37.5	37.5	28.0	44.5	44.5	14.0	27.5		19.0	32.5	
Total Split (%)	18.8%	33.5%	33.5%	25.0%	39.7%	39.7%	12.5%	24.6%		17.0%	29.0%	
Maximum Green (s)	15.0	30.0	30.0	22.0	37.0	37.0	10.0	20.0		15.0	25.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	3.0	3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	4.0		1.0	4.0	
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)	6.0	7.5	7.5	6.0	7.5	7.5	4.0	7.5		4.0	7.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	
Walk Time (s)		8.0	8.0		8.0	8.0		8.0			8.0	
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		33.0			33.0	
Pedestrian Calls (#/hr)		10	10		10	10		10			10	
Act Effct Green (s)	11.5	30.3	30.3	22.2	41.0	41.0	10.1	17.7	110.0	14.5	22.1	110.0
Actuated g/C Ratio	0.10	0.28	0.28	0.20	0.37	0.37	0.09	0.16	1.00	0.13	0.20	1.00
v/c Ratio	0.58	1.46	0.45	1.24	1.68	1.36	1.38	0.52	0.31	0.82	0.56	0.20

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	55.2	243.2	7.1	156.2	336.8	193.4	243.6	44.7	0.5	63.5	41.7	0.3
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	55.2	243.2	7.1	156.2	336.8	193.4	243.6	44.7	0.5	63.5	41.7	0.3
LOS	E	F	A	F	F	F	F	D	A	E	D	A
Approach Delay		187.9			262.1			67.4			37.4	
Approach LOS		F			F			E			D	
Queue Length 50th (m)	21.5	~211.1	0.0	~112.2	~354.5	~251.1	~61.0	31.1	0.0	39.0	40.5	0.0
Queue Length 95th (m)	40.6	#341.8	23.9	#203.8	#545.1	#425.9	#138.8	43.6	0.0	#83.2	54.4	0.0
Internal Link Dist (m)		391.1			381.1			416.2			342.9	
Turn Bay Length (m)	135.0		180.0	110.0		200.0	55.0		85.0	140.0		100.0
Base Capacity (vph)	455	939	605	667	1270	772	156	733	1500	455	889	1500
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	1.45	0.45	1.24	1.68	1.36	1.38	0.39	0.31	0.79	0.43	0.20

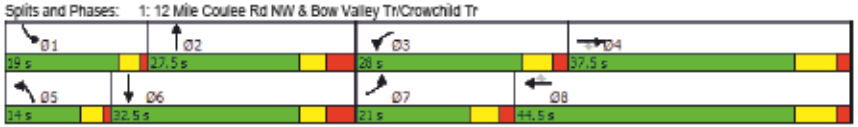
Intersection Summary

Cycle Length: 112
Actuated Cycle Length: 110
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.68
Intersection Signal Delay: 191.1 Intersection LOS: F
Intersection Capacity Utilization 112.9% 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: 1: 12 Mile Coulee Rd NW & Bow Valley Tr/Crowchild Tr



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	5	5	901	1348	54
Future Volume (Veh/h)	20	5	5	901	1348	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	5	5	948	1419	57
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				84		
pX, platoon unblocked	0.93					
vC, conflicting volume	1952	758	1486			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1868	758	1486			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	99	99			
cM capacity (veh/h)	58	344	445			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	321	632	946	530
Volume Left	21	5	0	0	0
Volume Right	5	0	0	0	57
cSH	69	445	1700	1700	1700
Volume to Capacity	0.38	0.01	0.37	0.56	0.31
Queue Length 95th (m)	11.5	0.3	0.0	0.0	0.0
Control Delay (s)	86.4	0.4	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	86.4	0.1		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		52.9%	ICU Level of Service	A
Analysis Period (min)		15		

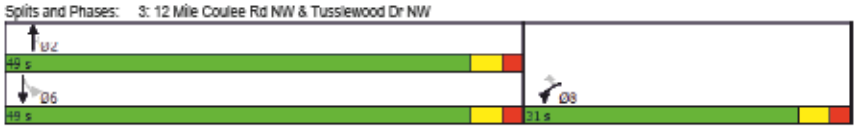
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	54	290	611	34	380	972
Future Volume (vph)	54	290	611	34	380	972
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.96		1.00
Frt		0.850		0.850		
Flt Protected	0.950					0.986
Satd. Flow (prot)	1704	1525	3408	1525	0	3360
Flt Permitted	0.950					0.649
Satd. Flow (perm)	1688	1487	3408	1466	0	2208
Satd. Flow (RTOR)		226		31		
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	57	305	643	36	400	1023
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	305	643	36	0	1423
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (s)	31.0	31.0	49.0	49.0	49.0	49.0
Total Split (%)	38.8%	38.8%	61.3%	61.3%	61.3%	61.3%
Maximum Green (s)	26.0	26.0	44.0	44.0	44.0	44.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0		5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	Min	Min
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)	18.0	18.0	18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)	10	10	10	10	10	10
Act Effct Green (s)	13.3	13.3	44.3	44.3		44.3
Actuated g/C Ratio	0.20	0.20	0.65	0.65		0.65
v/c Ratio	0.17	0.64	0.29	0.04		0.98

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	22.8	13.9	6.2	3.2		35.0
Queue Delay	0.0	0.0	0.0	0.0		0.0
Total Delay	22.8	13.9	6.2	3.2		35.0
LOS	C	B	A	A		C
Approach Delay	15.3		6.1			35.0
Approach LOS	B		A			C
Queue Length 50th (m)	6.3	8.9	13.0	0.2		65.6
Queue Length 95th (m)	14.5	29.7	38.6	4.3		#186.4
Internal Link Dist (m)	383.0		662.4			60.3
Turn Bay Length (m)	30.0			15.0		
Base Capacity (vph)	659	714	2232	970		1446
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	0.09	0.43	0.29	0.04		0.98

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 67.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 82.1%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: 12 Mile Coulee Rd NW & Tusslewood Dr NW



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	268	240	395	167	400	586
Future Volume (vph)	268	240	395	167	400	586
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.99	0.98	0.99			1.00
Frt		0.850	0.955			
Flt Protected	0.950					0.980
Satd. Flow (prot)	1704	1525	3217	0	0	3340
Flt Permitted	0.950					0.629
Satd. Flow (perm)	1689	1488	3217	0	0	2138
Satd. Flow (RTOR)		253	155			
Confl. Peds. (#/hr)	10	10		10	10	
Confl. Bikes (#/hr)		5		5		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	282	253	416	176	421	617
Shared Lane Traffic (%)						
Lane Group Flow (vph)	282	253	592	0	0	1038
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phase	8	8	2		6	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0		20.0	20.0
Minimum Split (s)	25.0	25.0	25.0		27.0	27.0
Total Split (s)	25.0	25.0	35.0		35.0	35.0
Total Split (%)	41.7%	41.7%	58.3%		58.3%	58.3%
Maximum Green (s)	20.0	20.0	30.0		30.0	30.0
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	5.0	5.0	5.0			5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	8.0	8.0	8.0		8.0	8.0
Flash Dont Walk (s)	12.0	12.0	12.0		14.0	14.0
Pedestrian Calls (#/hr)	10	10	10		10	10
Act Effct Green (s)	14.1	14.1	29.8			29.8
Actuated g/C Ratio	0.26	0.26	0.55			0.55
v/c Ratio	0.64	0.44	0.32			1.00dl

4: 12 Mile Coulee Rd NW & Tuscany Wy NW
03-20-2020

PM Peak Hour
After Development 2039

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Control Delay	24.6	5.2	5.8			23.4
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	24.6	5.2	5.8			23.4
LOS	C	A	A			C
Approach Delay	15.4		5.8			23.4
Approach LOS	B		A			C
Queue Length 50th (m)	25.5	0.0	10.5			41.8
Queue Length 95th (m)	45.6	13.3	23.2			#100.8
Internal Link Dist (m)	275.7		187.2			662.4
Turn Bay Length (m)						
Base Capacity (vph)	635	713	1867			1195
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.44	0.35	0.32			0.87

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 73.7%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	
dl Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 4: 12 Mile Coulee Rd NW & Tuscany Wy NW

Y:\2020\0012 Damkar Seniors 2020\4.0 Analysis & Design\4.3 Synchro\AD 2039 PM Peak.syn
Synchro 9

RSJ

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	5	5	507	792	62
Future Volume (Veh/h)	55	5	5	507	792	62
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	5	5	534	834	65
Pedestrians	10			10	10	
Lane Width (m)	3.5			3.5	3.5	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					211	
pX, platoon unblocked						
vC, conflicting volume	1164	470	909			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1164	470	909			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	68	99	99			
cM capacity (veh/h)	183	532	739			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	63	183	356	556	343
Volume Left	58	5	0	0	0
Volume Right	5	0	0	0	65
cSH	194	739	1700	1700	1700
Volume to Capacity	0.33	0.01	0.21	0.33	0.20
Queue Length 95th (m)	10.7	0.2	0.0	0.0	0.0
Control Delay (s)	32.3	0.3	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	32.3	0.1		0.0	
Approach LOS	D				

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	37.6%	ICU Level of Service		A
Analysis Period (min)	15			

APPENDIX E

Signal Warrant

City of Calgary - Traffic Signal Warrant Analysis

Main Street (name)	12 Mile Coulee	Direction (EW or NS)	NS
Side Street (name)	Tusslewood Drive	Direction (EW or NS)	EW
Quadrant / Int #	NW	Comments	Background 2028
for Warrant Calculation Results, please hit 'Page Down'	CHECKSHEET		

Road Authority:	City of Calgary
City:	Calgary
Analysis Date:	2020 Mar 13, Fri
Count Date:	-
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th &LT	Through	Th+RT+LT	Th &RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
12 Mile Coulee	NB					2		2,000	2
12 Mile Coulee	SB		2					530	2
Tusslewood Drive	WB	1					1		
Tusslewood Drive	EB								

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	1,100,000
Central Business District	(y/n)	n

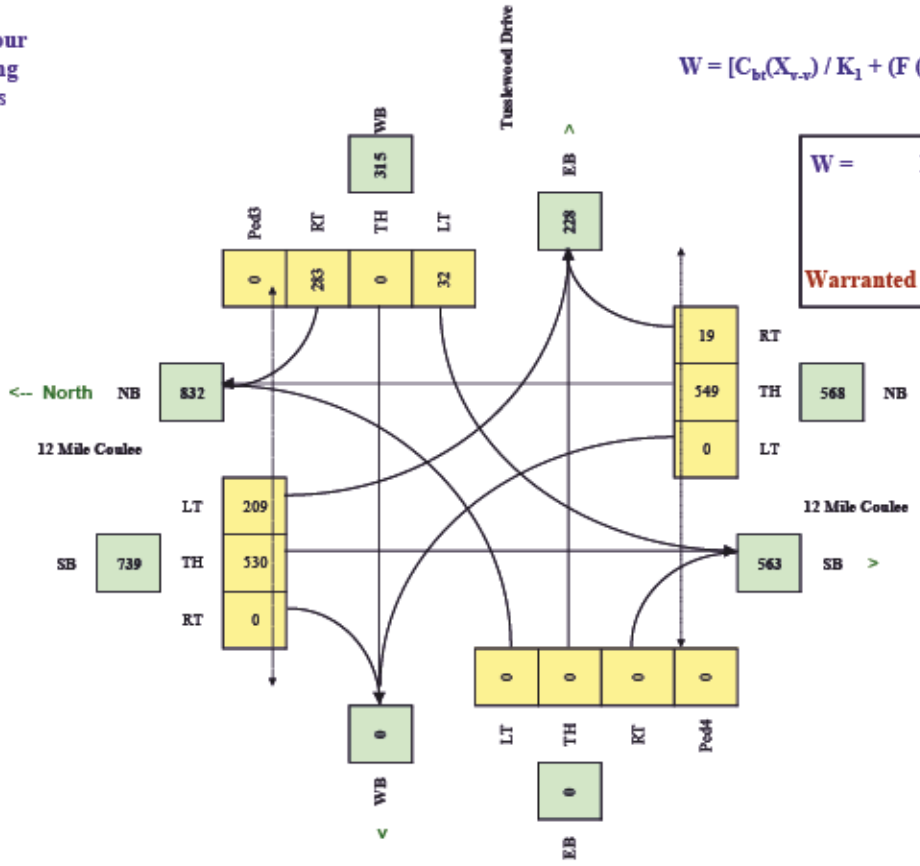
Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
12 Mile Coulee	NS	60	3.0%	n	0.0
Tusslewood Drive	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:00 - 8:00		3294	115	1253	3182		193		1697							
8:00 - 9:00																
11:00 - 12:00																
12:00 - 13:00																
16:00 - 17:00																
17:00 - 18:00																
Total (6-hour peak)	0	3,294	115	1,253	3,182	0	193	0	1,697	0	0	0	0	0	0	0
Average (6-hour peak)	0	549	19	209	530	0	32	0	283	0	0	0	0	0	0	0

Average 6-hour Peak Turning Movements

$$W = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$$



W =	155	155	0
		Veh	Ped

Warranted

RESET SHEET

City of Calgary - Traffic Signal Warrant Analysis

Main Street (name)	12 Mile Coulee	Direction (EW or NS)	NS
Side Street (name)	Tuscany Way	Direction (EW or NS)	EW
Quadrant / Int #	NW	Comments	Background 2028

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

Road Authority:	City of Calgary
City:	Calgary
Analysis Date:	2020 Mar 12, Thu
Count Date:	-
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th &LT	Through	Th+RT+LT	Th &RT	Excl RT	Up-Stream Signal (m)	# of Thru Lanes
12 Mile Coulee	NB					2		2,000	2
12 Mile Coulee	SB		2					1,200	2
Tuscany Way	WB				1				
Tuscany Way	EB								

Are the Tuscany Way WB right turns significantly impeded by through movements?	(y/n)	n
Are the Tuscany Way EB right turns significantly impeded by through movements?	(y/n)	n

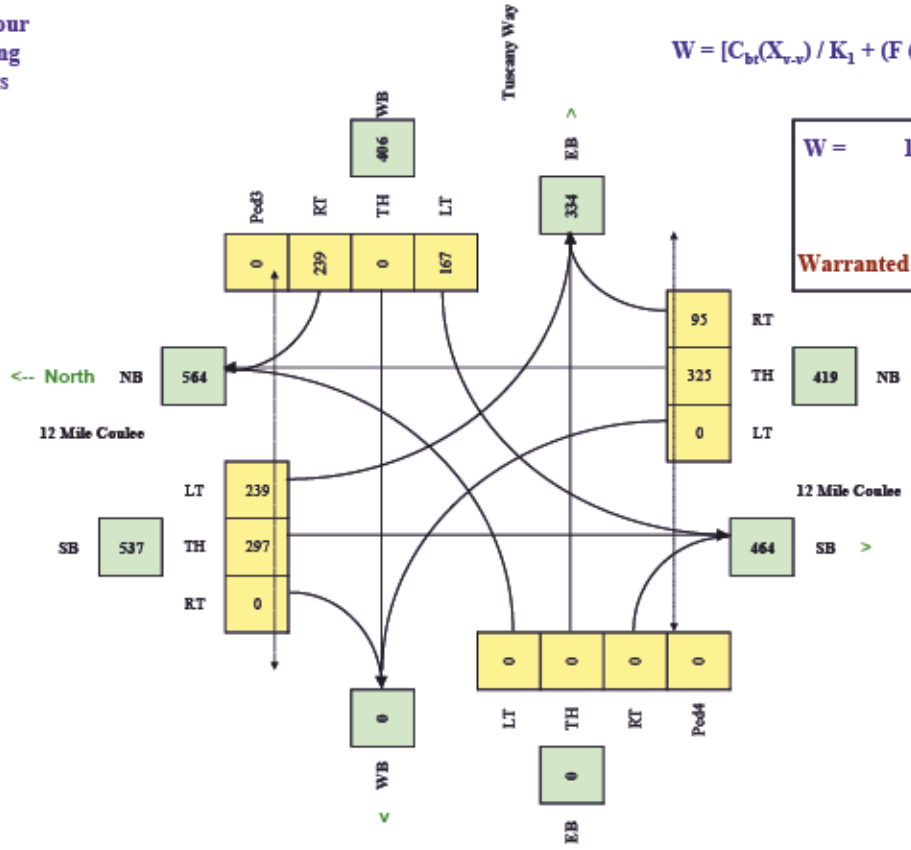
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	1,100,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
12 Mile Coulee	NS	60	2.0%	n	0.0
Tuscany Way	EW		2.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
Existing (6-Hour)		1947	569	1436	1783		1000		1436							
Total (6-hour peak)	0	1,947	569	1,436	1,783	0	1,000	0	1,436	0	0	0	0	0	0	0
Average (6-hour peak)	0	325	95	239	297	0	167	0	239	0	0	0	0	0	0	0

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	165	165	0
		Veh	*Ped*

Warranted

RESET SHEET

City of Calgary - Traffic Signal Warrant Analysis

Main Street (name)	12 Mile Coulee	Direction (EW or NS)	NS	Road Authority:	City of Calgary
Side Street (name)	Blueridge Rise	Direction (EW or NS)	EW	City:	Calgary
Quadrant / Int #	NW	Comments:	Background 2028	Analysis Date:	2020 Mar 13, Fri
for Warrant Calculation Results, please hit 'Page Down'	CHECKSHEET			Count Date:	-
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th &LT	Through	Th+RT+LT	Th &RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
12 Mile Coulee	NB					2		2,000	2
12 Mile Coulee	SB		2					440	2
Blueridge Rise	WB								
Blueridge Rise	EB	1					1		

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	1,100,000
Central Business District	(y/n)	n

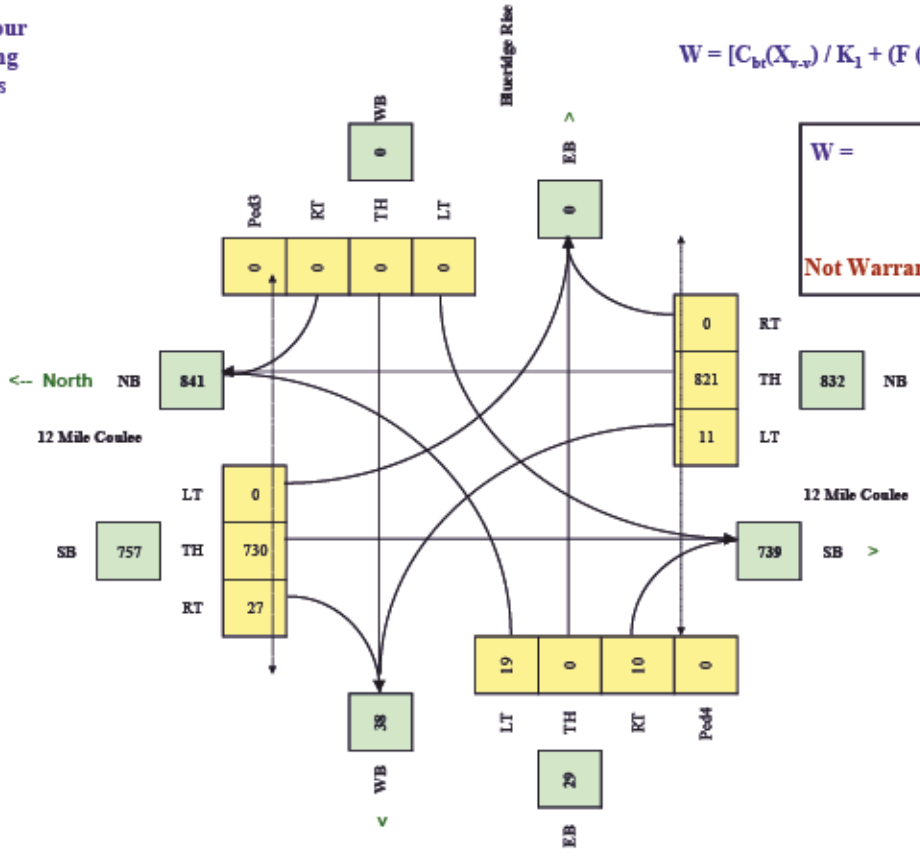
Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
12 Mile Coulee	NS	60	3.0%	n	0.0
Blueridge Rise	EW		1.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
Existing (6-Hour)	63	4928			4377	162				115		57				
Total (6-hour peak)	63	4,928	0	0	4,377	162	0	0	0	115	0	57	0	0	0	0
Average (6-hour peak)	11	821	0	0	730	27	0	0	0	19	0	10	0	0	0	0

Average 6-hour Peak Turning Movements

$$W = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$$



W =	22	22	0
		Veh	*Ped*

Not Warranted - Vs<75

RESET SHEET

City of Calgary - Traffic Signal Warrant Analysis

Main Street (name)	12 Mile Coulee	Direction (EW or NS)	NS
Side Street (name)	Blueridge Rise	Direction (EW or NS)	EW
Quadrant / Int #	NW	Comments	Background 2039
for Warrant Calculation Results, please hit 'Page Down'	CHECKSHEET		

Road Authority:	City of Calgary
City:	Calgary
Analysis Date:	2020 Mar 16, Mon
Count Date:	-
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th &LT	Through	Th+RT+LT	Th &RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
12 Mile Coulee	NB					2		2,000	2
12 Mile Coulee	SB		2					440	2
Blueridge Rise	WB								
Blueridge Rise	EB	1					1		

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	1,100,000
Central Business District	(y/n)	n

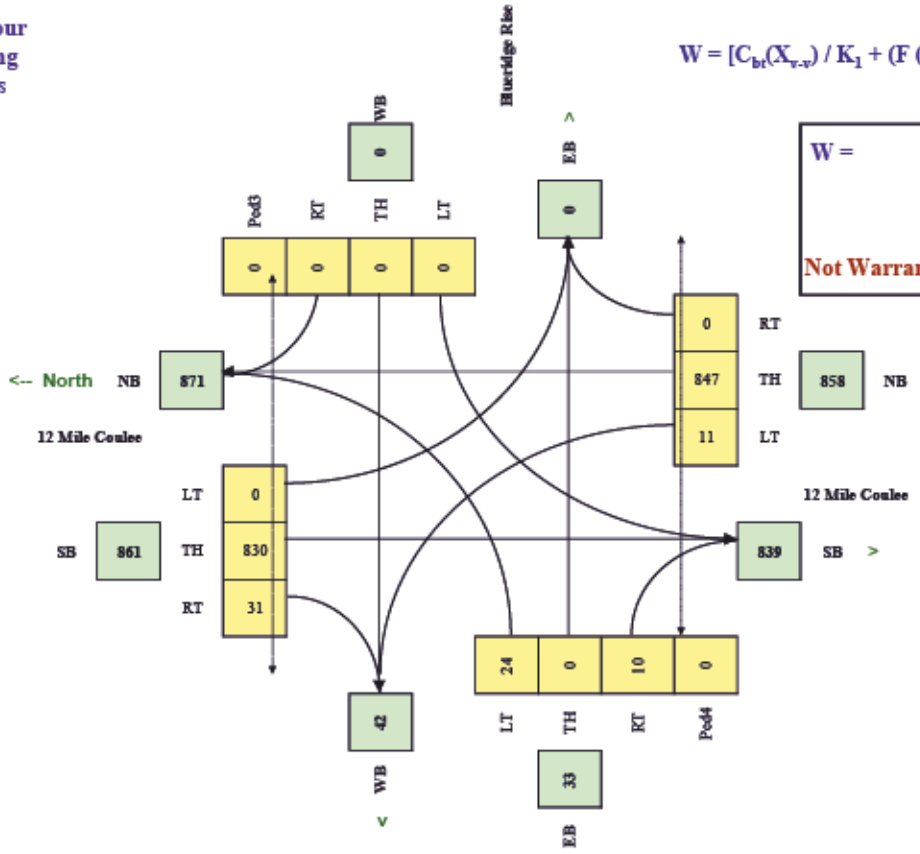
Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
12 Mile Coulee	NS	60	3.0%	n	0.0
Blueridge Rise	EW		1.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
Existing (6-Hour)	63	5084			4977	188				141		57				
Total (6-hour peak)	63	5,084	0	0	4,977	188	0	0	0	141	0	57	0	0	0	0
Average (6-hour peak)	11	847	0	0	830	31	0	0	0	24	0	10	0	0	0	0

Average 6-hour Peak Turning Movements

$$W = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$$



W =	27	27	0
		Veh	Ped

Not Warranted - Vs<75

RESET SHEET

City of Calgary - Traffic Signal Warrant Analysis

Main Street (name)	12 Mile Coulee	Direction (EW or NS)	NS	Road Authority:	City of Calgary
Side Street (name)	Blueridge Rise	Direction (EW or NS)	EW	City:	Calgary
Quadrant / Int #	NW	Comments:	After Development 2028	Analysis Date:	2020 Mar 16, Mon
for Warrant Calculation Results, please hit 'Page Down'	CHECKSHEET			Count Date:	-
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th &LT	Through	Th+RT+LT	Th &RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
12 Mile Coulee	NB					2		2,000	2
12 Mile Coulee	SB		2					440	2
Blueridge Rise	WB								
Blueridge Rise	EB	1					1		

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	1,100,000
Central Business District	(y/n)	n

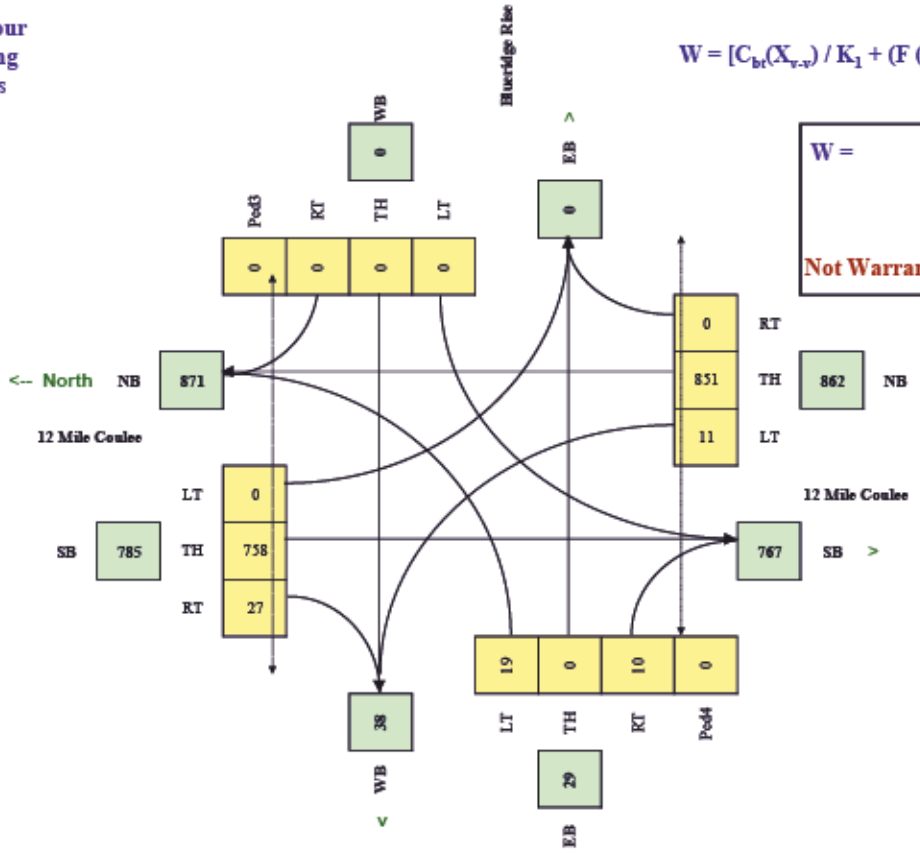
Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
12 Mile Coulee	NS	60	3.0%	n	0.0
Blueridge Rise	EW		1.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
Existing (6-Hour)	63	5108			4547	162				115		57				
Total (6-hour peak)	63	5,108	0	0	4,547	162	0	0	0	115	0	57	0	0	0	0
Average (6-hour peak)	11	851	0	0	758	27	0	0	0	19	0	10	0	0	0	0

Average 6-hour Peak Turning Movements

$$W = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$$



W =	22	22	0
		Veh	Ped

Not Warranted - Vs<75

RESET SHEET

City of Calgary - Traffic Signal Warrant Analysis

Main Street (name)	12 Mile Coulee	Direction (EW or NS)	NS	Road Authority:	City of Calgary
Side Street (name)	Blueridge Rise	Direction (EW or NS)	EW	City:	Calgary
Quadrant / Int #	NW	Comments:	After Development 2028	Analysis Date:	2020 Mar 16, Mon
for Warrant Calculation Results, please hit 'Page Down'	CHECKSHEET			Count Date:	-
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th &LT	Through	Th+RT+LT	Th &RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
12 Mile Coulee	NB					2		2,000	2
12 Mile Coulee	SB		2					440	2
Blueridge Rise	WB								
Blueridge Rise	EB	1					1		

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	1,100,000
Central Business District	(y/n)	n

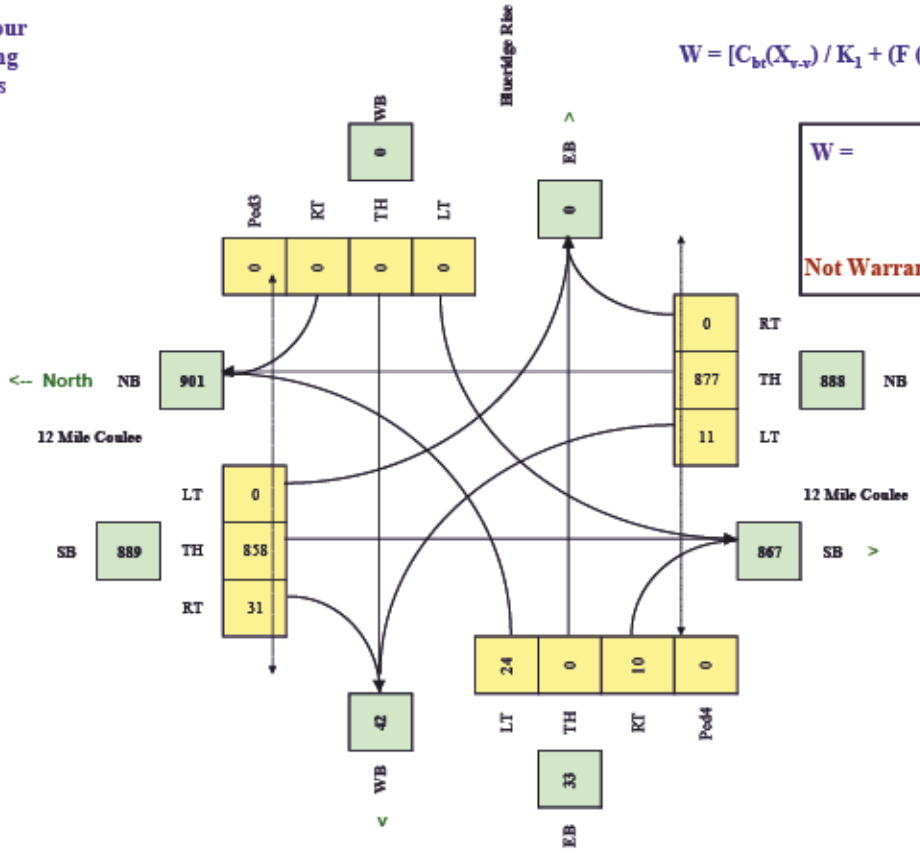
Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
12 Mile Coulee	NS	60	3.0%	n	0.0
Blueridge Rise	EW		1.0%	n	

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
Existing (6-Hour)	63	5264			5147	188				141		57				
Total (6-hour peak)	63	5,264	0	0	5,147	188	0	0	0	141	0	57	0	0	0	0
Average (6-hour peak)	11	877	0	0	858	31	0	0	0	24	0	10	0	0	0	0

Average 6-hour Peak Turning Movements

$$W = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$$



W =	28	28	0
		Veh	Ped

Not Warranted - Vs<75

RESET SHEET