

MEMO

TO: Scott MacCallum, P.Eng. – Clayton Developments
FROM: Patrick Hatton, P.Eng. – WSP Canada Inc.
SUBJECT: **Warrant Triggers Review, The Parks of Lake Charles**
DATE: **November 1, 2024**

Plans are being prepared for the development of The Parks of Lake Charles in Dartmouth, NS that includes a mix of residential, commercial, industrial and institutional uses that will be developed in multiple phases between 2025 and 2035 on the presently vacant lands generally bounded by Waverley Road in the west, Highway 107 (Forest Hills Extension) in the east and north, and existing residential development in the south. The proposed development is planned to include a total of 4,759 residential units (single family houses and multi-unit buildings), 25,000ft² of boutique grocery, 40,800ft² of retail plaza, and an elementary school. A Traffic Impact Study (TIS) has been completed for this development (February 2023, WSP) and has been accepted by HRM.

Subsequent to the TIS submission, HRM has requested a review of the phasing and identification of when during the development buildout each recommended roadway modification would become warranted. This Memorandum has been prepared to review these modification triggers using projected background traffic volumes developed in the TIS which include 2022 turning movement counts and an applied 0.5% annual growth rate.

PLANNED PHASING

The development is planned to be constructed over several phases and subphases by multiple developers (Port Wallace Holdings Ltd., Conrad Developments, and Whebby Lands). The phasing plan is shown in Figure 1.

Trip generation estimates have been prepared using published rates and equations from *Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers, Washington, 2021). Trip generation estimates for the AM and PM peak hours of adjacent streets have been prepared for each development phase using land use plans prepared in March 2022 and is based on:

- Number of units for the residential developments;
- Leasable square footage for the commercial and industrial development; and,
- Number of students for the elementary school.

The following assumptions on trip generation, distribution, and assignment have been carried forward from the February 2023 TIS:

- For the purposes of this Memorandum, it has been assumed that the planned elementary school (institutional block noted on Figure 1, trip generation and assignment included in the 2023 TIS) will be fully developed during the initial development stages of development and all school generated trips were assigned in all scenarios.
- Assumptions and reductions for non-auto trips have been retained from the previous 2023 TIS.
- All site generated trips have been distributed and assigned to project intersections based on distributions and assignment rules identified in the accepted 2023 TIS.

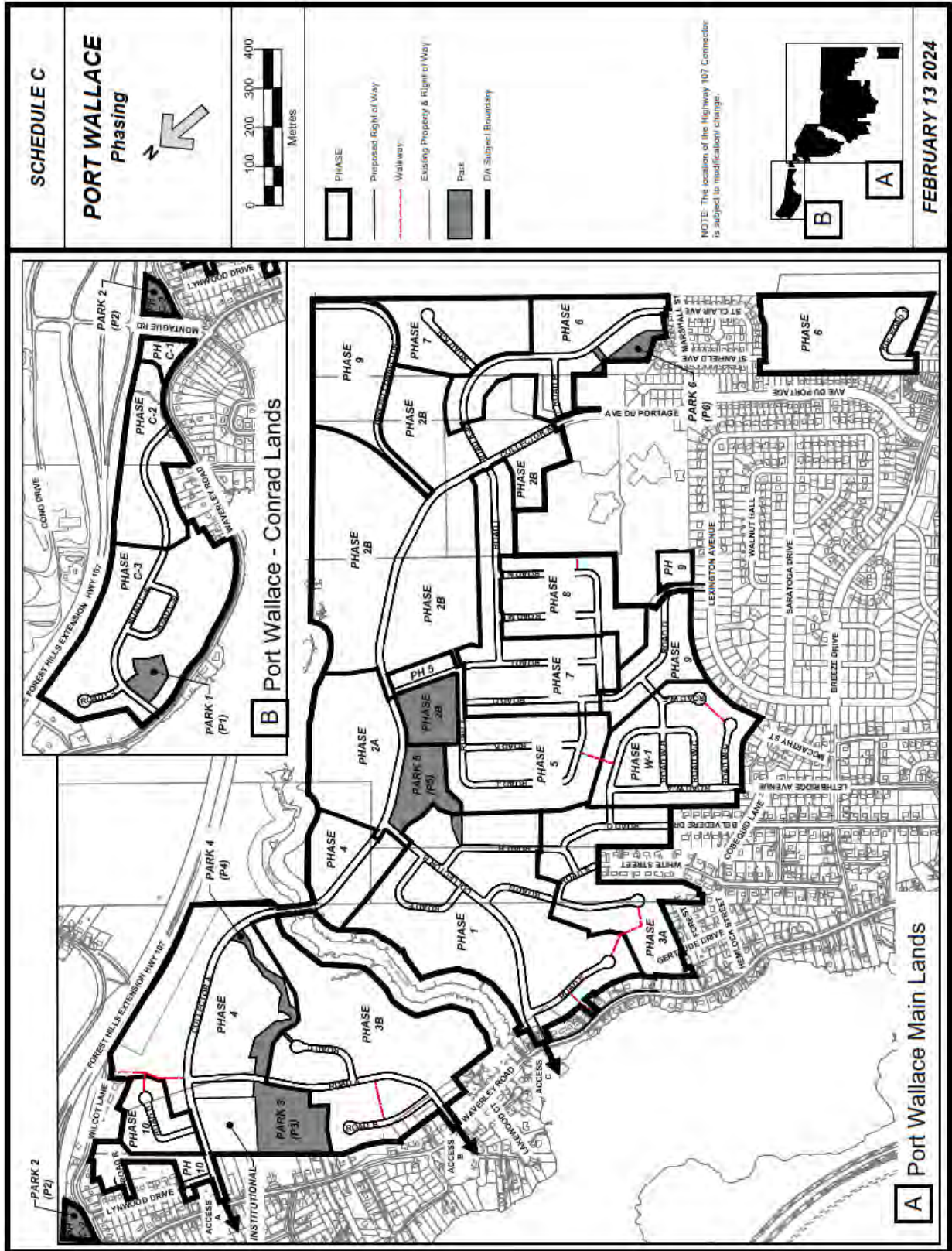


Figure 1 – Phasing Plan



Trip generation estimates for the proposed residential and commercial portions of the development area are summarized in Table 1. It is estimated that the residential and commercial development will generate:

- 1,916 two-way primary vehicle trips (481 entering and 1,435 exiting) during the AM peak hour; and,
- 2,525 two-way primary vehicle trips (1,560 entering and 965 exiting) during the PM peak hour.

Table 1 - Trip Generation Estimates for the Proposed Residential & Commercial Development

Development Phase ¹	Projected Development Year	Full Occupancy Year	Concept Land Uses ²						Total Trips by Phase ⁴				Development Phase ¹	Total Adjusted Trips by Phase ^{4,5}			
			Single Family-Detached	Single Family-Attached	Multi- Mid Rise	Multi- High Rise	Supermarket ³	Strip Retail Plaza ³	AM Peak		PM Peak			AM Peak	PM Peak		
									In	Out	In	Out			In	Out	
1	2025	2025	96	125	145	0	0.0	0.0	45	151	154	95	1	38	128	131	81
C-1	2025	2025	0	0	0	0	0.0	14.0	22	14	49	49	C-1	6	4	12	12
2A	2026	2028	0	0	60	465	25.0	26.8	67	144	196	150	2A	48	116	148	109
2B	2026	2034	0	62	610	482	0.0	0.0	98	275	291	175	2B	83	234	247	149
3A	2027	2027	109	12	0	0	0.0	0.0	21	64	72	43	3A	18	54	61	37
3B	2027	2027	127	0	0	0	0.0	0.0	23	69	78	46	3B	20	59	66	39
C-2	2027	2034	45	0	120	0	0.0	0.0	18	73	75	44	C-2	17	69	71	42
4	2028	2038	0	50	651	96	0.0	0.0	79	219	236	141	4	67	186	201	120
5	2029	2029	105	22	0	0	0.0	0.0	22	66	73	43	5	19	56	62	37
C-3	2029	2039	68	0	192	0	0.0	0.0	30	102	109	64	C-3	23	97	104	61
6	2030	2030	89	82	0	0	0.0	0.0	27	80	84	52	6	23	68	71	44
7	2031	2040	107	156	125	0	0.0	0.0	49	162	166	102	7	42	138	141	87
W-1	2031	2031	174	0	0	0	0.0	0.0	31	92	105	62	W-1	26	78	89	53
8	2032	2032	44	91	0	0	0.0	0.0	20	59	60	38	8	17	50	51	32
9	2033	2033	58	0	0	0	0.0	0.0	11	34	38	22	9	9	29	32	19
10	2034	2040	55	0	136	0	0.0	0.0	22	81	86	50	10	19	69	73	43
Totals			1077	600	2039	1043	25.0	40.8	585	1685	1872	1176	Totals	481	1435	1560	965

NOTES:
1. Development Phases are from September 2024 Land Use Plans.
2. Concept Land Uses provided by Port Wallace Holdings Ltd.
3. Commercial units are per 1000 square feet.
4. Trip estimates have been prepared using rates and equations from *Trip Generation 11th Edition* (Institute of Transportation Engineers, Washington, 2021).
5. Reductions for non-auto trips include 15% for residential for land south of Montague Road and 5% for land north of Montague; 75% reduction of neighbourhood commercial trips, which includes: 25% for Neighbourhood Shopping for non-auto use; and 50% for Neighbourhood Shopping Trips for vehicle trips between the proposed residential and proposed commercial development.

It is anticipated that there will be a delay between the development of many of the phases and the occupancy of the multi-family dwelling (apartment) units during the phase. It has been assumed that a maximum of 200 multi-family units in the development area will be occupied each year during the buildout period and this will impact the trip generation and anticipated triggers as to when the roadway modifications will be required. The number of multi-family units anticipated to be fully occupied by phase and for each year are identified in Table 2. This occupancy rate has been applied in identifying the triggers as to when modifications will be recommended for implementation.

Table 2 – Anticipated Fully Occupancy of Multi-family units by Phase and Year

Phases	Multi-Family									Total Occupancy by Year	Cumulative Occupancy by Year
	1	2A	2B	C-2	4	C-3	7	10	10		
Build-Out Year	2025	2026	2026	2027	2028	2029	2031	2034	2034		
Occupancy Year	2025	145								145	145
	2026		200							200	345
	2027		200							200	545
	2028		125	75						200	745
	2029			200						200	945
	2030			200						200	1145
	2031			200						200	1345
	2032			200						200	1545
	2033			200						200	1745
	2034			17	120	63				200	1945
	2035				200	200				200	2145
	2036				200	200				200	2345
	2037				200	200				200	2545
	2038				84	116				200	2745
	2039					76	124			200	2945
	2040						1	136		137	3082
Total Units by Phases	145	525	1092	120	747	192	125	136		3082	

IDENTIFIED MODIFICATION TRIGGERS

In the Parks of Lake Charles Traffic Impact Study, February 2023, intersection performance analysis was reviewed for key study area intersections and development access streets to determine street network improvements that are expected to be necessary to provide satisfactory levels of performance for background traffic volumes and to mitigate impacts of site generated trips. These modifications have been identified as recommended based on left turn warrants (Ontario Supplement to TAC), signal warrants (TAC), or where added lanes will improve intersection operations to meet HRM thresholds. Table 3 identifies the year when each roadway modification is recommended for implementation and considers the occupancy rate for the apartment units identified in Table 2.

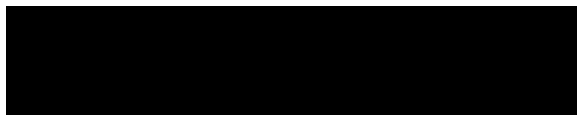
Table 3 – Summary of Recommendations

Recommendation	Intersection	Recommended Modifications for Full Site Build-Out	Recommended Construction Year
1	Waverley Rd at Montague Rd / Charles Keating Dr	Install Traffic signals. Install Westbound left-turn lane and Northbound right turn lane	Traffic signal installation should be planned for 2027. The added left turning lanes are recommended for installation by 2029.
2	Waverley Rd at Breeze Dr	Westbound left-turn lane on Breeze Dr and Southbound left-turn lane on Waverley Rd	Install in 2025.
3	Waverley Rd at Montebello Dr	Northbound right-turn lane on Waverley Rd	Currently required, per TIS. Install in 2025.
4	Montebello Dr / Ave du Portage at Caledonia Rd / Breeze Dr	Traffic signals with a dedicated left-turn lane and a shared through/right-turn lane on all approaches	Construct signals and added left turn lanes by 2029.
5	Main St at Caledonia Rd	Eastbound and Westbound dual left-turns on Main St and Northbound and Southbound additional through lanes on Woodlawn Rd and Caledonia Rd	Intersection review and modifications currently warranted.
6	Waverley Rd at Ave du Portage	Install traffic signals Install Southbound and Westbound left-turn lanes	Install southbound and westbound left turn lanes in 2026. Install traffic signals in 2037.
7	Waverley Rd at Stillwater Dr	Install Southbound left-turn lane on Waverley Rd	HRM has decided that this left turn lane is not to be installed. HRM should monitor collisions and left turn conflicts at this location as development progresses. If installed, expected to be warranted in 2030.
8	Waverley Rd at Conrad North	Clear sightline obstructions north of intersection on east side of Waverley Rd	When intersection is constructed.
9	Ave du Portage at Hwy 107 Connector	Signalize intersection and install Northbound right turn lane, southbound left turn lane, two-lane approach on 107 Connector	Install 2 lane approach on Connector when intersection is constructed Install signals and northbound right and southbound left lanes when full interchange is constructed



If you have any questions or comments, please contact me by email at patrick.hatton@wsp.com or by telephone at 902-444-7712.

Sincerely,



Senior Transportation Engineer
WSP Canada Inc.



APPENDIX A

WARRANTS AND INTERSECTION OPERATIONAL RESULTS

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table A-1 - Waverley Road - Charles Keating Drive / Montague Road Intersection Projected Volumes With Site Year 2028

Main Street (name)	Waverley Road	Direction (EW or NS)	NS	Date:	October 2024
Side Street (name)	Keating / Montague	Direction (EW or NS)	EW	City:	Dartmouth, NS

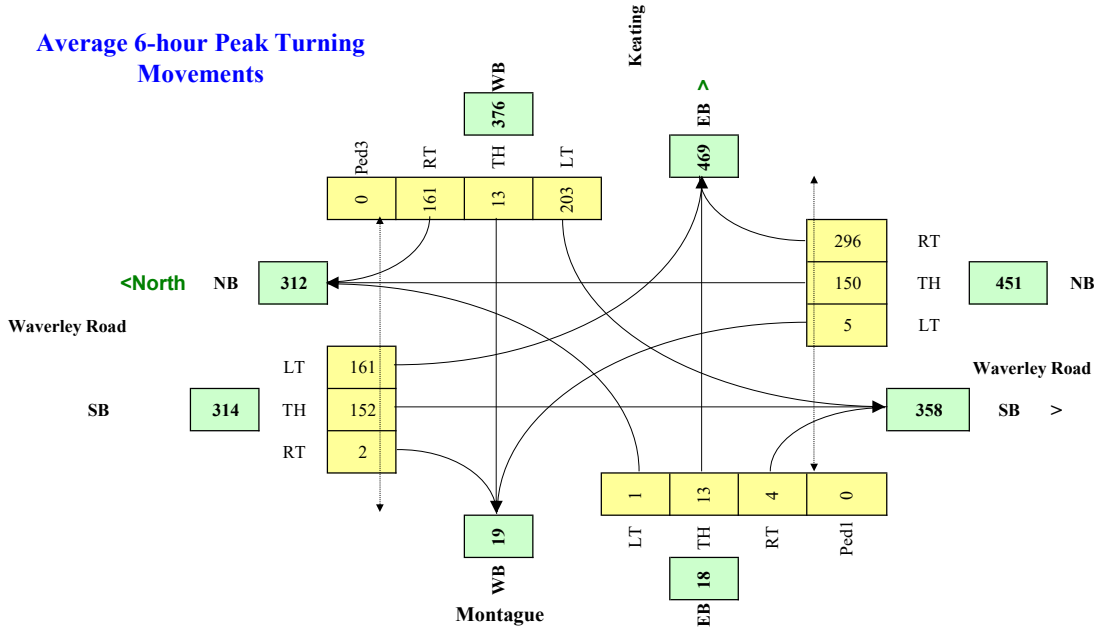
Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	Upstream Signal (m)	# of Thru Lanes
Waverley Road	NB			1				1
Waverley Road	SB	1			1			1
Montague	WB		1			1		
Keating	EB			1				

Other input		Speed (Km/h)	Trucks % (y/n)	Bus Rt (y/n)	Median (m)
Waverley Road	NS	50	5.0%	n	0.0
Keating / Montague	EW	50	5.0%	n	

	Ped4 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped1 EW S side
7:00 - 8:00				
8:00 - 9:00				
11:00 - 12:00				
12:00 - 13:00				
15:00 - 16:00				
16:00 - 17:00				
Total (6-hour peak)	0	0	0	0
Average (6-hour peak)	0	0	0	0

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	450,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	5	95	355	215	165	0	125	5	90	0	10	5
8:00 - 9:00	0	125	425	245	200	0	135	5	85	0	25	5
11:00 - 12:00	5	90	195	110	115	0	150	5	95	5	10	0
12:00 - 13:00	5	105	235	100	95	5	140	10	110	0	10	5
15:00 - 16:00	5	270	290	145	175	0	320	20	300	0	10	5
16:00 - 17:00	10	215	275	150	160	5	345	30	285	0	10	5
Total (6-hour peak)	30	900	1,775	965	910	10	1,215	75	965	5	75	25
Average (6-hour peak)	5	150	296	161	152	2	203	13	161	1	13	4



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p}) L) / K_2] \times C_1$$

W =	106	106	0
		<i>Veh</i>	<i>Ped</i>
Warranted			

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table A-2 - Breeze / Caledonia / Montebello / Portage Intersection Projected Volumes With Site Year 2030

Main Street (name)	Breeze / Caledonia	Direction (EW or NS)	NS	Date:	October 2024
Side Street (name)	Montebello / Portage	Direction (EW or NS)	EW	City:	Dartmouth, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	Upstream Signal (m)	# of Thru Lanes
Caledonia	NB	1			1			1
Breeze	SB	1			1			1
Montebello	EB	1			1			
Portage	WB	1			1			

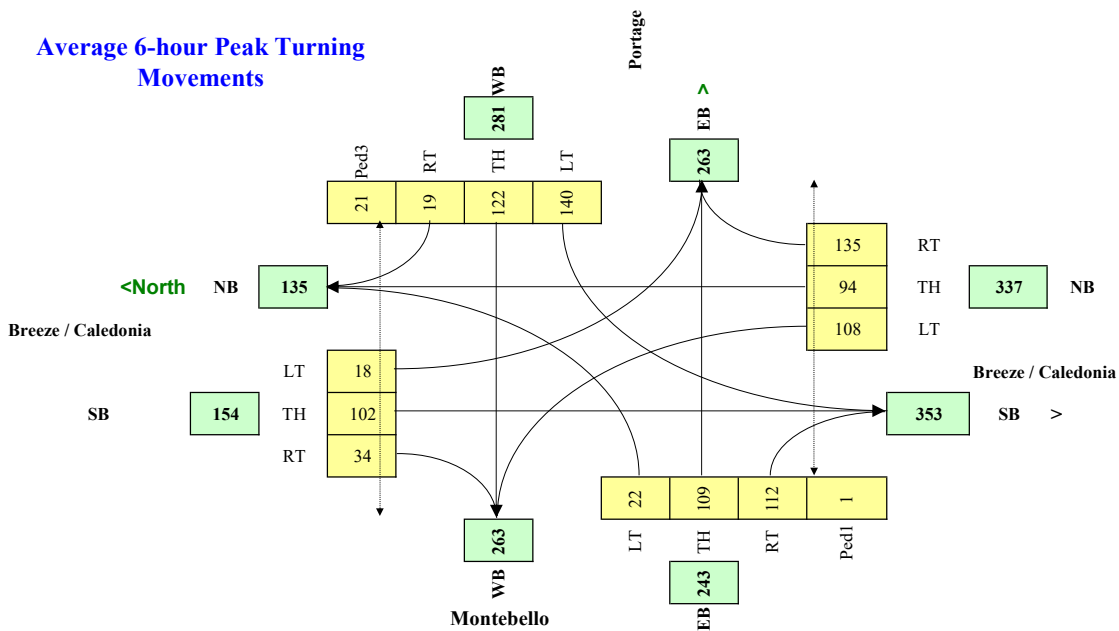
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Breeze / Caledonia	NS	50	5.0%	n	0.0
Montebello / Portage	EW	50	5.0%	n	

	Ped4 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped1 EW S Side
7:00 - 8:00	1	4	3	0
8:00 - 9:00	6	0	11	1
11:00 - 12:00	2	3	49	0
12:00 - 13:00	2	5	38	0
15:00 - 16:00	10	9	21	1
16:00 - 17:00	8	0	6	1
Total (6-hour peak)	29	21	128	3
Average (6-hour peak)	5	4	21	1

Demographics		
Elementary School	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	450,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	100	60	130	30	80	55	140	170	25	15	95	75
8:00 - 9:00	125	100	155	30	150	35	225	215	20	15	110	150
11:00 - 12:00	85	60	90	5	70	20	85	70	15	20	65	90
12:00 - 13:00	90	95	70	10	90	30	95	55	5	15	70	80
15:00 - 16:00	125	120	185	15	95	30	150	115	25	35	150	115
16:00 - 17:00	120	130	180	20	125	35	145	105	25	30	165	160
Total (6-hour peak)	645	565	810	110	610	205	840	730	115	130	655	670
Average (6-hour peak)	108	94	135	18	102	34	140	122	19	22	109	112

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 =	118	110	8
		Veh	Ped
Warranted			

2005 Canadian Traffic Signal Warrant Matrix Analysis

**Table A-3 - Waverley Road - Avenue du Portage Intersection
Projected Volumes With Site Year 2037**

Main Street (name)	Waverley Road	Direction (EW or NS)	NS	Date:	October 2024
Side Street (name)	Avenue du Portage	Direction (EW or NS)	EW	City:	Dartmouth, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	Upstream Signal (m)	# of Thru Lanes
Waverley Road	NB	1		1				1
Waverley Road	SB	1						1
Avenue du Portage	WB	1				1		

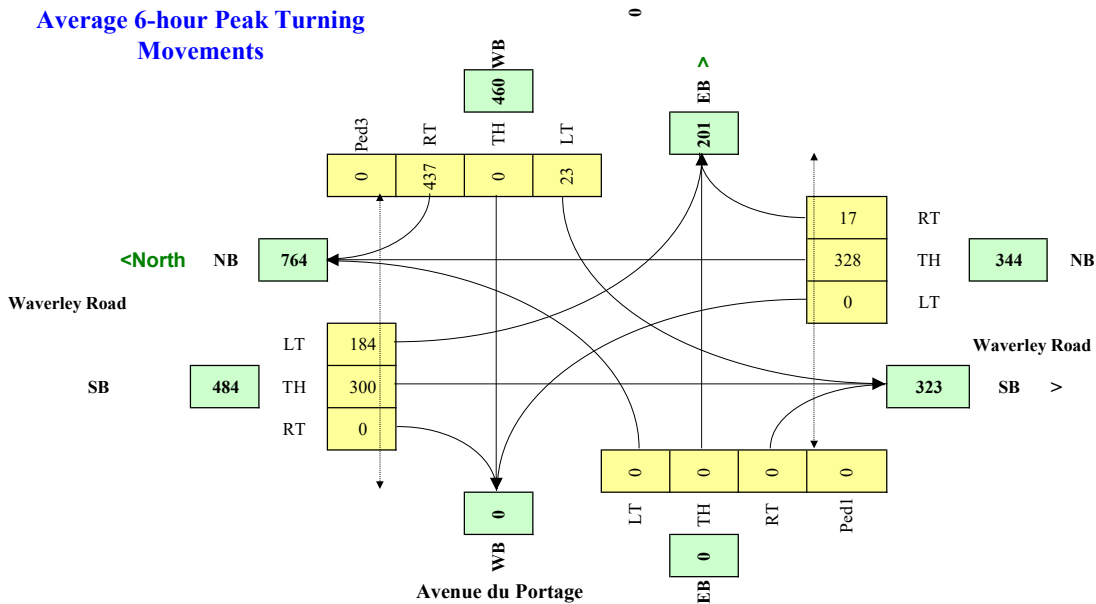
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Waverley Road	NS	50	5.0%	n	0.0
Avenue du Portage	EW	50	5.0%	n	

	Ped4 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped1 EW S side
7:00 - 8:00				
8:00 - 9:00				
11:00 - 12:00				
12:00 - 13:00				
15:00 - 16:00				
16:00 - 17:00				
Total (6-hour peak)	0	0	0	0
Average (6-hour peak)	0	0	0	0

Demographics		
Elementary School	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	450,000
Central Business District	(y/n)	n

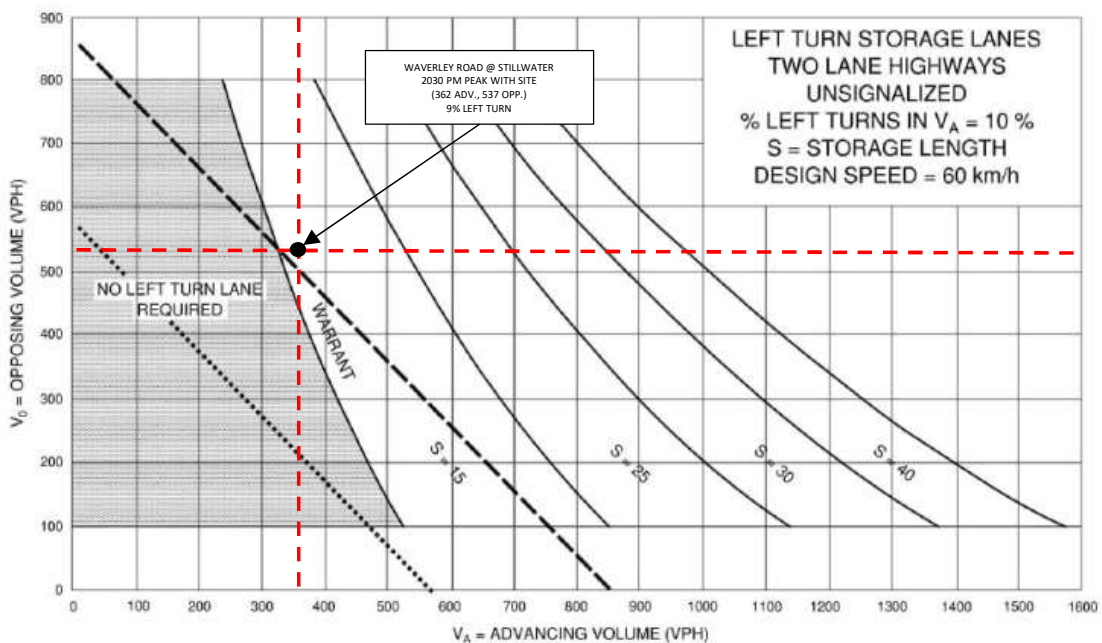
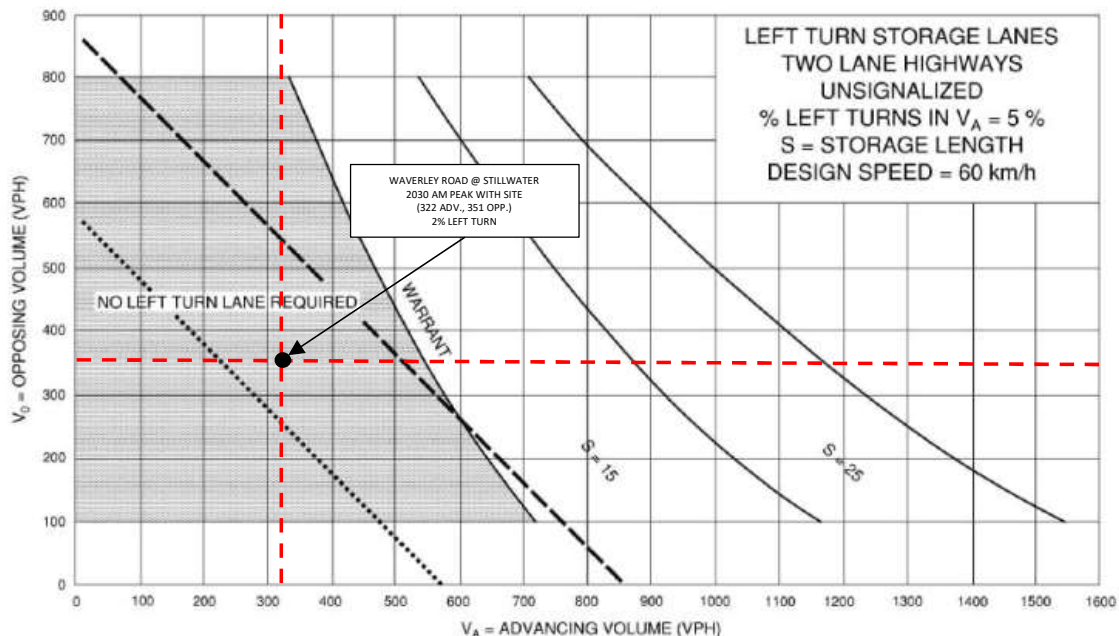
Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	0	295	15	85	255	0	35	0	530	0	0	0
8:00 - 9:00	0	360	20	105	290	0	40	0	665	0	0	0
11:00 - 12:00	0	210	10	125	225	0	15	0	285	0	0	0
12:00 - 13:00	0	270	10	125	205	0	15	0	285	0	0	0
15:00 - 16:00	0	455	20	325	410	0	15	0	415	0	0	0
16:00 - 17:00	0	375	25	340	415	0	20	0	440	0	0	0
Total (6-hour peak)	0	1,965	100	1,105	1,800	0	140	0	2,620	0	0	0
Average (6-hour peak)	0	328	17	184	300	0	23	0	437	0	0	0

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p}) L) / K_2] \times C_1$$

W =	100	100	0
	<i>Veh</i>	<i>Ped</i>	
Warranted			

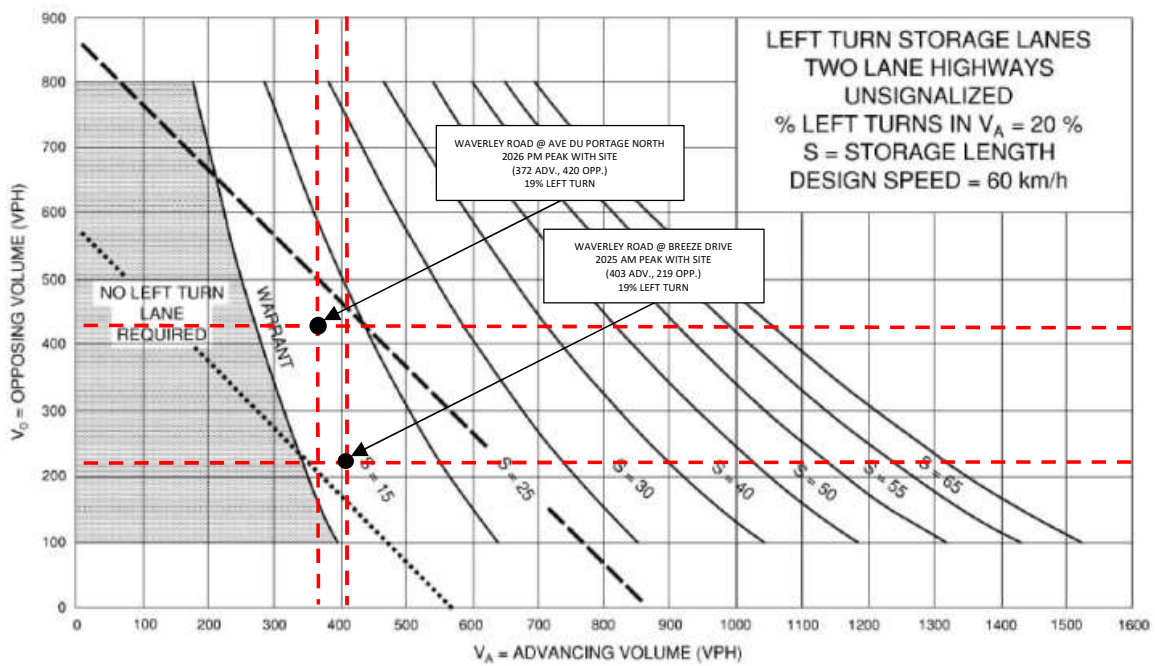
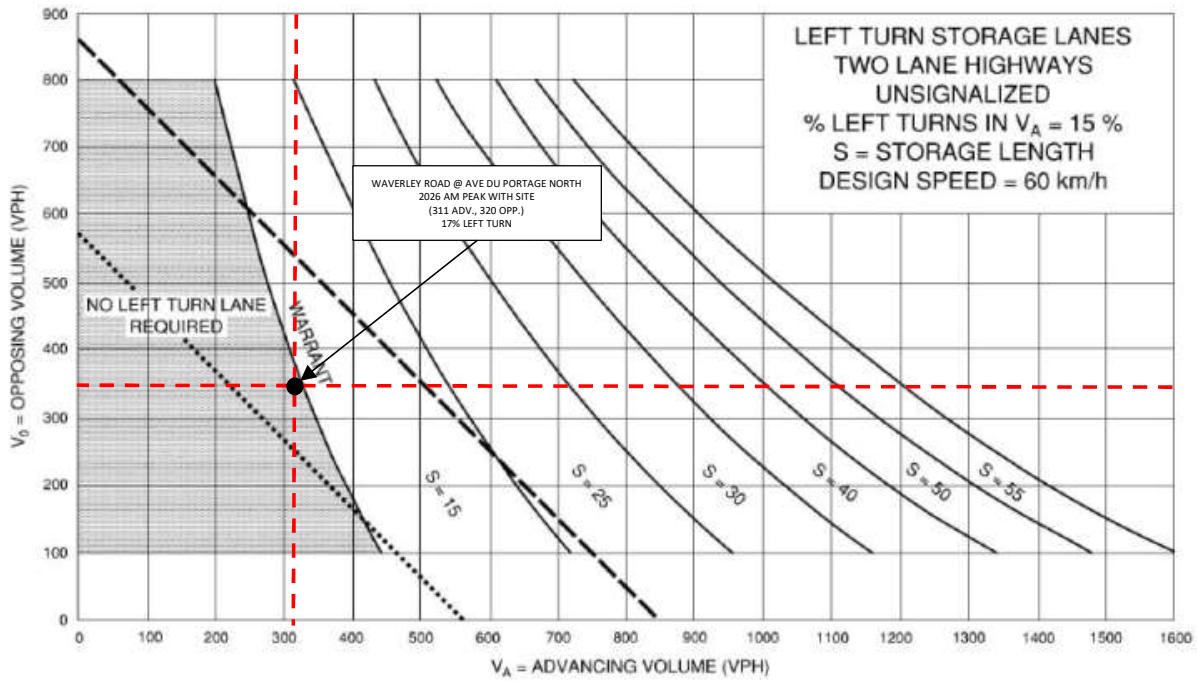


Port Wallace Development
Dartmouth, NS

Figure A-1

Year 2030 With Site Development
Left Turn Lane Warrants for 5% and 10% Turning Volume

October 2024

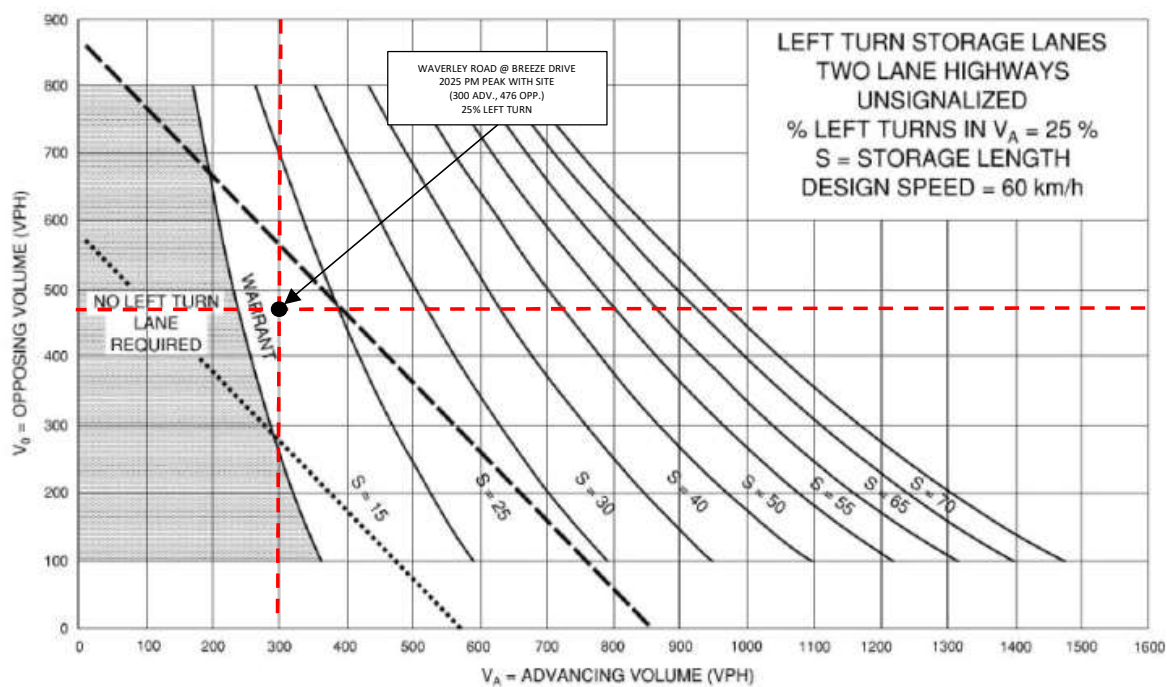


Port Wallace Development
Dartmouth, NS

Figure A-2

Year 2025 and 2026 With Site Development
Left Turn Lane Warrants for 15% and 20% Turning Volume

October 2024



Port Wallace Development
Dartmouth, NS

Figure A-3

Year 2025 With Site Development
Left Turn Lane Warrants for 25% Turning Volume

October 2024

1: Waverley Road & Charles Keating Drive/Montague Road

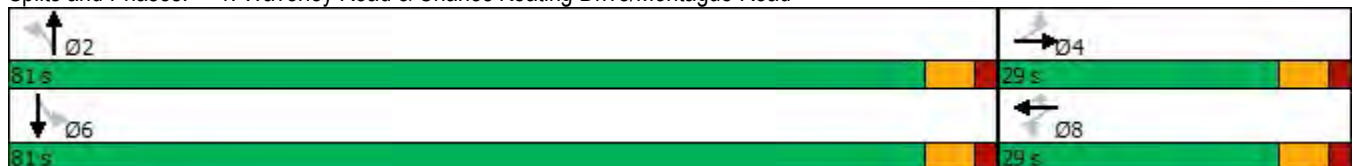
AM Peak with Site Dev Year 2029

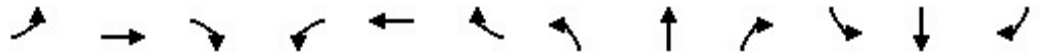
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	25	5	117	10	92	5	123	493	260	210	5
Future Volume (vph)	5	25	5	117	10	92	5	123	493	260	210	5
Satd. Flow (prot)	0	1837	0	0	1801	1601	0	1682	0	1789	1878	0
Flt Permitted		0.950			0.716			0.998		0.395		
Satd. Flow (perm)	0	1757	0	0	1349	1601	0	1679	0	744	1878	0
Satd. Flow (RTOR)		5				100		397			2	
Lane Group Flow (vph)	0	37	0	0	138	100	0	675	0	283	233	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Total Split (s)	29.0	29.0		29.0	29.0	29.0	81.0	81.0		81.0	81.0	
Total Lost Time (s)		6.0			6.0	6.0		6.0		6.0	6.0	
Act Effct Green (s)		11.5			11.5	11.5		30.9		30.9	30.9	
Actuated g/C Ratio		0.21			0.21	0.21		0.56		0.56	0.56	
v/c Ratio		0.10			0.49	0.24		0.61		0.68	0.22	
Control Delay		19.8			28.3	7.7		5.6		18.7	6.7	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay		19.8			28.3	7.7		5.6		18.7	6.7	
LOS		B			C	A		A		B	A	
Approach Delay		19.8			19.6			5.6			13.3	
Approach LOS		B			B			A			B	
Queue Length 50th (m)		2.1			9.9	0.0		11.6		15.9	9.2	
Queue Length 95th (m)		11.5			36.2	11.5		39.7		50.2	23.1	
Internal Link Dist (m)		146.8			172.5			267.3			271.9	
Turn Bay Length (m)						60.0				65.0		
Base Capacity (vph)		785			600	768		1651		728	1837	
Starvation Cap Reductn		0			0	0		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.05			0.23	0.13		0.41		0.39	0.13	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 55.2
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 11.0
 Intersection Capacity Utilization 80.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 1: Waverley Road & Charles Keating Drive/Montague Road



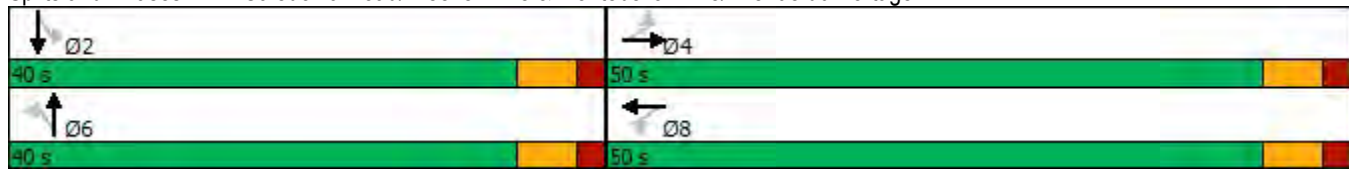


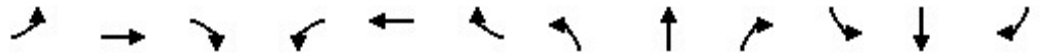
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	15	119	152	185	219	52	129	98	156	35	150	40
Future Volume (vph)	15	119	152	185	219	52	129	98	156	35	150	40
Satd. Flow (prot)	0	1743	0	0	1816	0	0	1750	0	0	1824	0
Flt Permitted		0.967			0.733			0.795			0.902	
Satd. Flow (perm)	0	1690	0	0	1358	0	0	1415	0	0	1658	0
Satd. Flow (RTOR)		89			10			44			14	
Lane Group Flow (vph)	0	310	0	0	496	0	0	417	0	0	244	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Act Effct Green (s)		30.6			30.6			24.6			24.6	
Actuated g/C Ratio		0.45			0.45			0.36			0.36	
v/c Ratio		0.38			0.81			0.78			0.40	
Control Delay		10.7			28.6			30.3			19.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.7			28.6			30.3			19.3	
LOS		B			C			C			B	
Approach Delay		10.7			28.6			30.3			19.3	
Approach LOS		B			C			C			B	
Queue Length 50th (m)		16.9			50.8			41.3			21.3	
Queue Length 95th (m)		39.2			105.2			#92.3			47.5	
Internal Link Dist (m)		165.3			264.9			111.8			149.7	
Turn Bay Length (m)												
Base Capacity (vph)		1188			936			791			910	
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		0.26			0.53			0.53			0.27	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 68.4
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 23.7
 Intersection LOS: C
 Intersection Capacity Utilization 95.4%
 ICU Level of Service F
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Caledonia Road/Breeze Drive & Montebello Drive/Avenue du Portage





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	30	139	155	115	110	90	118	124	129	21	126	35
Future Volume (vph)	30	139	155	115	110	90	118	124	129	21	126	35
Satd. Flow (prot)	0	1754	0	0	1777	0	0	1766	0	0	1823	0
Flt Permitted		0.940			0.740			0.831			0.926	
Satd. Flow (perm)	0	1657	0	0	1339	0	0	1492	0	0	1699	0
Satd. Flow (RTOR)		71			31			34			15	
Lane Group Flow (vph)	0	352	0	0	343	0	0	403	0	0	198	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Act Effct Green (s)		19.0			19.0			18.9			18.9	
Actuated g/C Ratio		0.37			0.37			0.37			0.37	
v/c Ratio		0.53			0.66			0.70			0.31	
Control Delay		13.9			20.2			20.8			12.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.9			20.2			20.8			12.9	
LOS		B			C			C			B	
Approach Delay		13.9			20.2			20.8			12.9	
Approach LOS		B			C			C			B	
Queue Length 50th (m)		16.9			20.5			25.3			10.5	
Queue Length 95th (m)		50.6			60.4			68.4			30.0	
Internal Link Dist (m)		165.3			264.9			111.8			149.7	
Turn Bay Length (m)												
Base Capacity (vph)		1415			1140			1078			1221	
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		0.25			0.30			0.37			0.16	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 51.1
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 17.6
 Intersection Capacity Utilization 87.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service E

Splits and Phases: 4: Caledonia Road/Breeze Drive & Montebello Drive/Avenue du Portage

