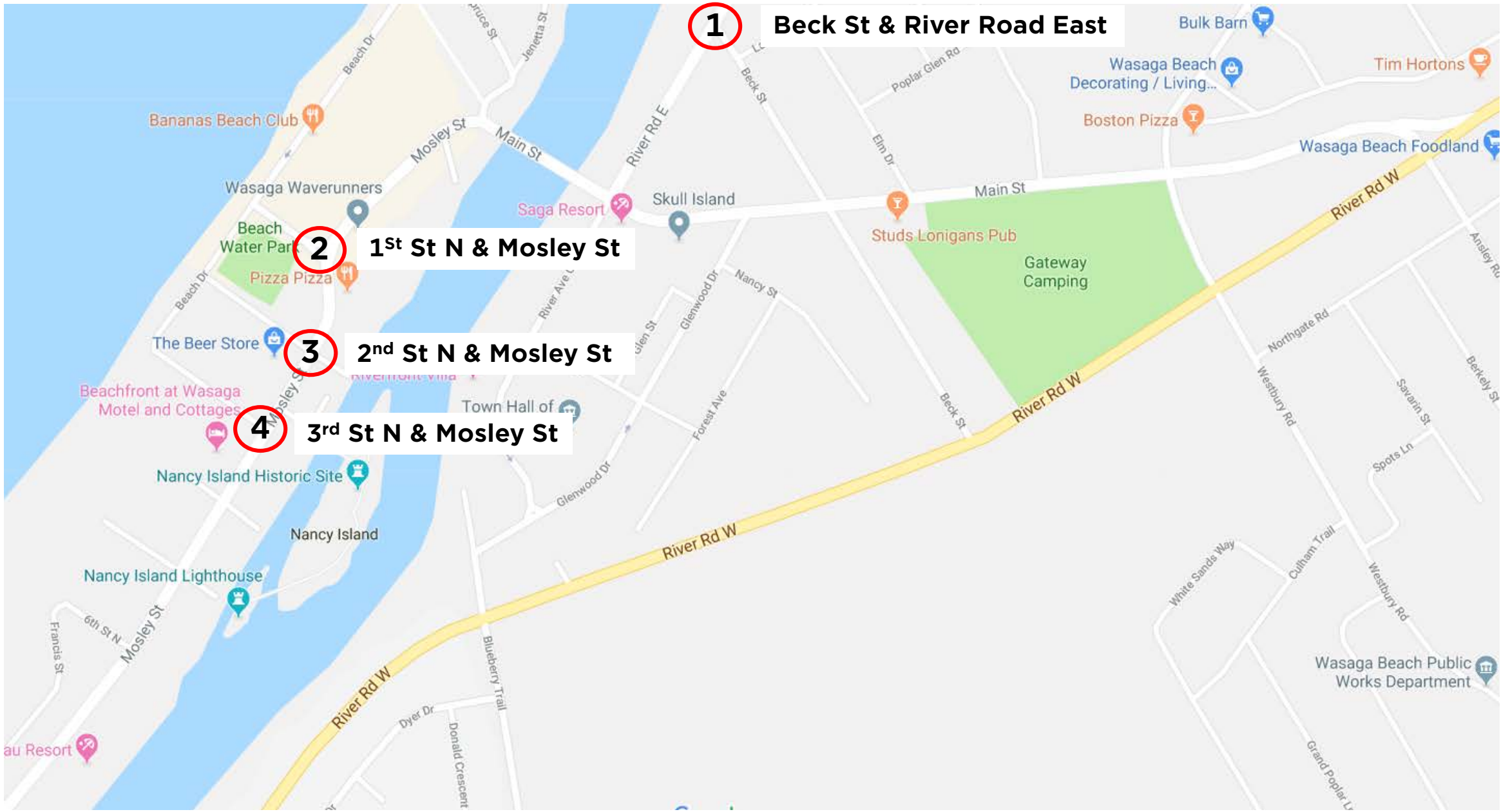
Appendix A:
Traffic Counts


1 Beck St & River Road East
2 1St St N & Mosley St
3 2nd St N & Mosley St
4 3rd St N & Mosley St
Bulk Barn
Wasaga Beach Decorating / Living...
Tim Hortons
Boston Pizza
Wasaga Beach Foodland
Bananas Beach Club
Wasaga Waverunners
Beach Water Park
Pizza Pizza
Saga Resort
Skull Island
Studs Lonigans Pub
Gateway Camping
Main St
River Rd W
River Rd E
Mosley St
Beach Dr
Jenetta St
Poplar Glen Rd
Elm Dr
Beck St
Nancy St
Glenwood Dr
Forest Ave
River Ave
Northgate Rd
Westbury Rd
Savarin St
Berkely St
Spots Ln
Ansley Rd
The Beer Store
Beachfront at Wasaga Motel and Cottages
Town Hall of
Nancy Island Historic Site
Nancy Island
Nancy Island Lighthouse
6th St N
Francis St
Blueberry Trail
Dyer Dr
Donald Crescent
White Sands Way
Cultham Trail
Wasaga Beach Public Works Department
Grand Poplar Ln

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Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

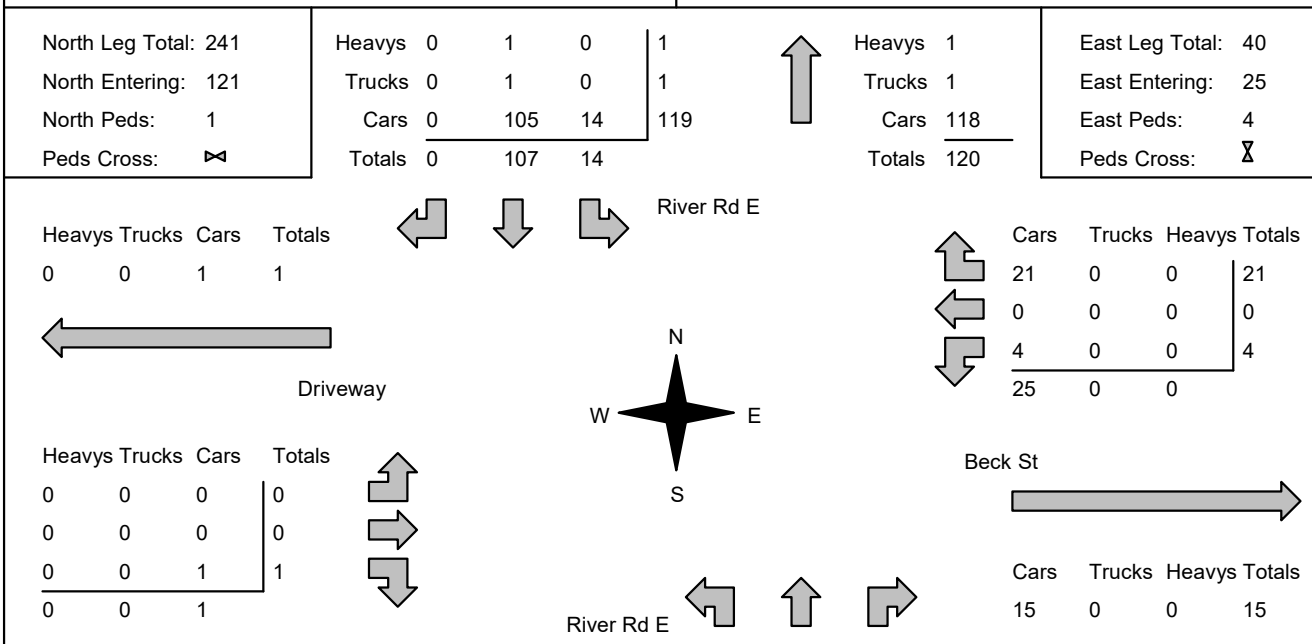
Municipality: Wasaga Beach
Site #: 1909900001
Intersection: River Rd E & Beck St
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: River Rd E runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:30:00
To: 16:30:00

Municipality: Wasaga Beach
Site #: 1909900001
Intersection: River Rd E & Beck St
TFR File #: 1
Count date: 19-Jun-19

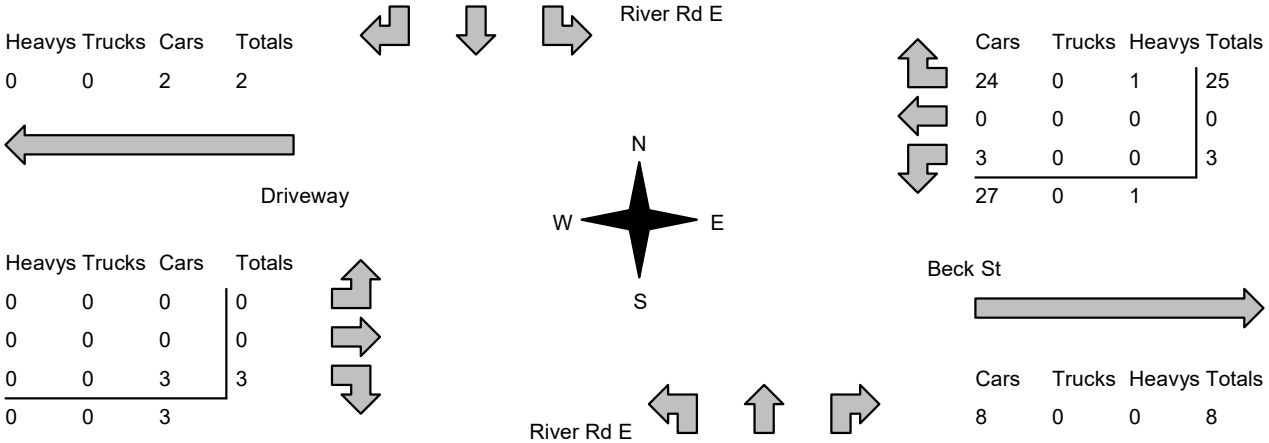
Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: River Rd E runs N/S

North Leg Total:	273			
North Entering:	126			
North Peds:	5			
Peds Cross:	⋈			
Heavys	0	2	0	2
Trucks	0	1	0	1
Cars	0	116	7	123
Totals	0	119	7	
Heavys	2			
Trucks	2			
Cars	143			
Totals	147			
East Leg Total:	36			
East Entering:	28			
East Peds:	7			
Peds Cross:	⧖			



Peds Cross:	⧖			
West Peds:	4			
West Entering:	3			
West Leg Total:	5			
Cars	122			
Trucks	1			
Heavys	2			
Totals	125			
Cars	2	119	1	122
Trucks	0	2	0	2
Heavys	0	1	0	1
Totals	2	122	1	
Peds Cross:	⋈			
South Peds:	2			
South Entering:	125			
South Leg Total:	250			

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Total Count Diagram

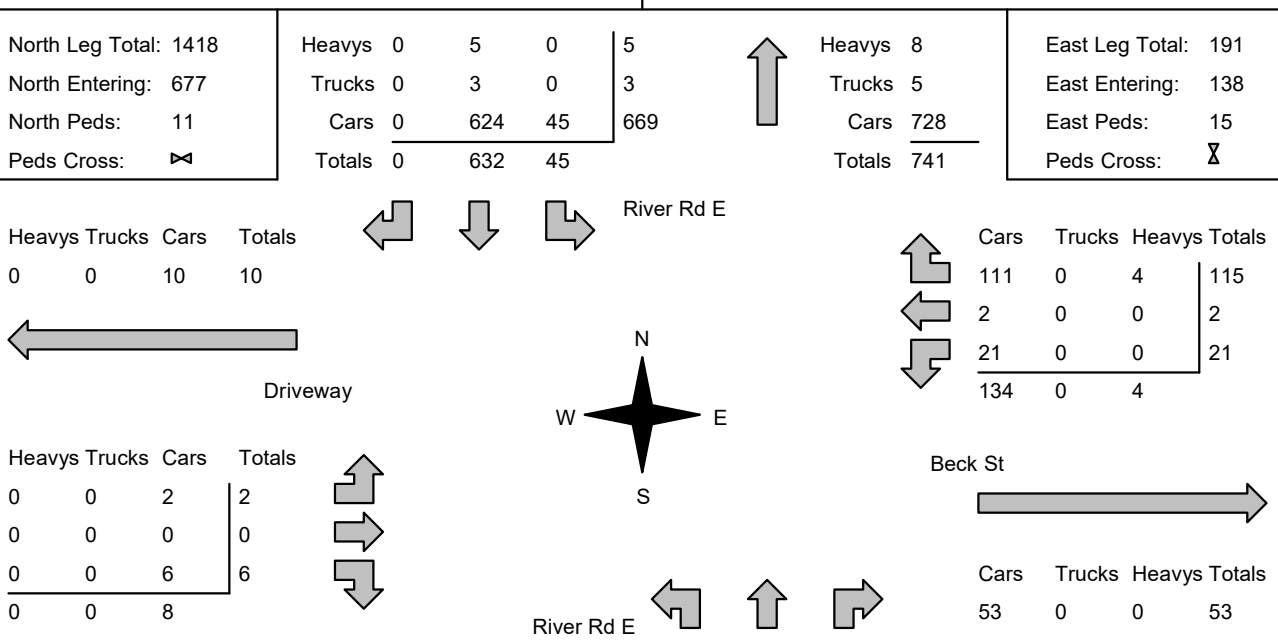
Municipality: Wasaga Beach
Site #: 1909900001
Intersection: River Rd E & Beck St
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: River Rd E runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: River Rd E & Beck St | **Count Date:** 19-Jun-19 | **Municipality:** Wasaga Beach

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*13*	*95*	*0*	*108*	*3*
9:00:00	*8*	*106*	*0*	*114*	*1*
10:00:00	*4*	*107*	*0*	*111*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*11*	*107*	*0*	*118*	*7*
17:00:00	*3*	*108*	*0*	*111*	*0*
18:00:00	*6*	*109*	*0*	*115*	*0*
Totals:	45	632	0	677	11

North/South Total Approaches: *0*, *203*, *212*, *205*, *0*, *223*, *252*, *222*, 1317

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*1*	*94*	*0*	*95*	*0*
9:00:00	*1*	*96*	*1*	*98*	*0*
10:00:00	*1*	*91*	*2*	*94*	*2*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*2*	*102*	*1*	*105*	*2*
17:00:00	*3*	*138*	*0*	*141*	*0*
18:00:00	*0*	*103*	*4*	*107*	*0*
S Totals:	8	624	8	640	4

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*4*	*0*	*16*	*20*	*2*
9:00:00	*4*	*0*	*20*	*24*	*3*
10:00:00	*4*	*1*	*17*	*22*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*3*	*0*	*24*	*27*	*4*
17:00:00	*2*	*1*	*24*	*27*	*4*
18:00:00	*4*	*0*	*14*	*18*	*2*
Totals:	21	2	115	138	15

East/West Total Approaches: *0*, *20*, *25*, *24*, *0*, *30*, *29*, *18*, 146

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*0*	*0*	*0*	*1*
9:00:00	*0*	*0*	*1*	*1*	*1*
10:00:00	*1*	*0*	*1*	*2*	*3*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*0*	*3*	*3*	*3*
17:00:00	*1*	*0*	*1*	*2*	*4*
18:00:00	*0*	*0*	*0*	*0*	*3*
W Totals:	2	0	6	8	15

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*7*	*5*	*8*	*0*	*12*	*4*	*4*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	23	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
7:30:00	4	2	43	20	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0
7:45:00	9	5	67	24	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
8:00:00	13	4	94	27	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	1
8:15:00	16	3	119	25	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
8:30:00	18	2	148	29	0	0	0	0	1	1	0	0	0	0	2	1	0	0	3	0
8:45:00	20	2	172	24	0	0	0	0	1	0	0	0	0	0	2	0	0	0	3	0
9:00:00	21	1	198	26	0	0	0	0	1	0	0	0	0	0	2	0	0	0	4	1
9:15:00	21	0	228	30	0	0	0	0	1	0	0	0	0	0	2	0	0	0	4	0
9:30:00	23	2	255	27	0	0	0	0	1	0	0	0	0	0	2	0	0	0	4	0
9:45:00	24	1	281	26	0	0	0	0	1	0	0	0	0	0	2	0	0	0	4	0
10:00:00	25	1	305	24	0	0	0	0	1	0	0	0	0	0	2	0	0	0	4	0
10:15:00	25	0	305	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	4	0
15:00:00	25	0	305	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	4	0
15:15:00	28	3	338	33	0	0	0	0	2	1	0	0	0	0	3	1	0	0	4	0
15:30:00	32	4	359	21	0	0	0	0	2	0	0	0	0	0	3	0	0	0	6	2
15:45:00	34	2	384	25	0	0	0	0	2	0	0	0	0	0	3	0	0	0	6	0
16:00:00	36	2	409	25	0	0	0	0	2	0	0	0	0	0	4	1	0	0	11	5
16:15:00	37	1	451	42	0	0	0	0	2	0	0	0	0	0	4	0	0	0	11	0
16:30:00	39	2	475	24	0	0	0	0	3	1	0	0	0	0	5	1	0	0	11	0
16:45:00	39	0	494	19	0	0	0	0	3	0	0	0	0	0	5	0	0	0	11	0
17:00:00	39	0	515	21	0	0	0	0	3	0	0	0	0	0	5	0	0	0	11	0
17:15:00	41	2	549	34	0	0	0	0	3	0	0	0	0	0	5	0	0	0	11	0
17:30:00	42	1	580	31	0	0	0	0	3	0	0	0	0	0	5	0	0	0	11	0
17:45:00	44	2	602	22	0	0	0	0	3	0	0	0	0	0	5	0	0	0	11	0
18:00:00	45	1	624	22	0	0	0	0	3	0	0	0	0	0	5	0	0	0	11	0
18:15:00	45	0	624	0	0	0	0	0	3	0	0	0	0	0	5	0	0	0	11	0
18:15:15	45	0	624	0	0	0	0	0	3	0	0	0	0	0	5	0	0	0	11	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	2	1	0	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	2	0	0	0	12	5	0	0	0	0	0	0	0	0	0	0	0	0	2	2
8:00:00	4	2	0	0	16	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:15:00	5	1	0	0	21	5	0	0	0	0	0	0	0	0	0	0	0	0	3	1
8:30:00	6	1	0	0	28	7	0	0	0	0	0	0	0	0	0	0	0	0	4	1
8:45:00	6	0	0	0	31	3	0	0	0	0	0	0	0	0	0	0	1	1	4	0
9:00:00	8	2	0	0	35	4	0	0	0	0	0	0	0	0	0	0	1	0	5	1
9:15:00	10	2	0	0	40	5	0	0	0	0	0	0	0	0	0	0	1	0	5	0
9:30:00	11	1	0	0	44	4	0	0	0	0	0	0	0	0	0	0	2	1	5	0
9:45:00	11	0	1	1	48	4	0	0	0	0	0	0	0	0	0	0	2	0	5	0
10:00:00	12	1	1	0	51	3	0	0	0	0	0	0	0	0	0	0	2	0	5	0
10:15:00	12	0	1	0	51	0	0	0	0	0	0	0	0	0	0	0	2	0	5	0
15:00:00	12	0	1	0	51	0	0	0	0	0	0	0	0	0	0	0	2	0	5	0
15:15:00	13	1	1	0	56	5	0	0	0	0	0	0	0	0	0	0	2	0	5	0
15:30:00	14	1	1	0	61	5	0	0	0	0	0	0	0	0	0	0	3	1	5	0
15:45:00	15	1	1	0	69	8	0	0	0	0	0	0	0	0	0	0	3	0	7	2
16:00:00	15	0	1	0	73	4	0	0	0	0	0	0	0	0	0	0	4	1	9	2
16:15:00	15	0	1	0	81	8	0	0	0	0	0	0	0	0	0	0	4	0	10	1
16:30:00	17	2	1	0	85	4	0	0	0	0	0	0	0	0	0	0	4	0	12	2
16:45:00	17	0	1	0	90	5	0	0	0	0	0	0	0	0	0	0	4	0	12	0
17:00:00	17	0	2	1	97	7	0	0	0	0	0	0	0	0	0	0	4	0	13	1
17:15:00	18	1	2	0	101	4	0	0	0	0	0	0	0	0	0	0	4	0	13	0
17:30:00	19	1	2	0	105	4	0	0	0	0	0	0	0	0	0	0	4	0	14	1
17:45:00	21	2	2	0	108	3	0	0	0	0	0	0	0	0	0	0	4	0	15	1
18:00:00	21	0	2	0	111	3	0	0	0	0	0	0	0	0	0	0	4	0	15	0
18:15:00	21	0	2	0	111	0	0	0	0	0	0	0	0	0	0	0	4	0	15	0
18:15:15	21	0	2	0	111	0	0	0	0	0	0	0	0	0	0	0	4	0	15	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	25	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	1	46	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	1	0	66	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	1	0	92	26	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0
8:15:00	1	0	121	29	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8:30:00	2	1	143	22	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8:45:00	2	0	164	21	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
9:00:00	2	0	188	24	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
9:15:00	2	0	208	20	1	0	0	0	1	0	0	0	0	0	2	1	0	0	1	1
9:30:00	3	1	228	20	3	2	0	0	2	1	0	0	0	0	2	0	0	0	1	0
9:45:00	3	0	251	23	3	0	0	0	2	0	0	0	0	0	2	0	0	0	2	1
10:00:00	3	0	277	26	3	0	0	0	2	0	0	0	0	0	2	0	0	0	2	0
10:15:00	3	0	277	0	3	0	0	0	2	0	0	0	0	0	2	0	0	0	2	0
15:00:00	3	0	277	0	3	0	0	0	2	0	0	0	0	0	2	0	0	0	2	0
15:15:00	3	0	306	29	3	0	0	0	2	0	0	0	0	0	2	0	0	0	2	0
15:30:00	4	1	328	22	3	0	0	0	2	0	0	0	0	0	2	0	0	0	2	0
15:45:00	5	1	348	20	3	0	0	0	2	0	0	0	0	0	2	0	0	0	4	2
16:00:00	5	0	378	30	4	1	0	0	3	1	0	0	0	0	2	0	0	0	4	0
16:15:00	5	0	416	38	4	0	0	0	3	0	0	0	0	0	2	0	0	0	4	0
16:30:00	6	1	447	31	4	0	0	0	4	1	0	0	0	0	3	1	0	0	4	0
16:45:00	7	1	479	32	4	0	0	0	5	1	0	0	0	0	3	0	0	0	4	0
17:00:00	8	1	513	34	4	0	0	0	5	0	0	0	0	0	3	0	0	0	4	0
17:15:00	8	0	540	27	4	0	0	0	5	0	0	0	0	0	4	1	0	0	4	0
17:30:00	8	0	567	27	5	1	0	0	5	0	0	0	0	0	4	0	0	0	4	0
17:45:00	8	0	587	20	8	3	0	0	5	0	0	0	0	0	4	0	0	0	4	0
18:00:00	8	0	615	28	8	0	0	0	5	0	0	0	0	0	4	0	0	0	4	0
18:15:00	8	0	615	0	8	0	0	0	5	0	0	0	0	0	4	0	0	0	4	0
18:15:15	8	0	615	0	8	0	0	0	5	0	0	0	0	0	4	0	0	0	4	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:30:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1
8:45:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:00:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:15:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2
9:30:00	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0
9:45:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1
10:00:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
10:15:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
15:00:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
15:15:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
15:30:00	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1
15:45:00	1	0	0	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	6	0
16:00:00	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2
16:15:00	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1
16:30:00	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1
16:45:00	2	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
17:00:00	2	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	12	2
17:15:00	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
17:30:00	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
17:45:00	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
18:00:00	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	15	3
18:15:00	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
18:15:15	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 9:00:00
To: 10:00:00

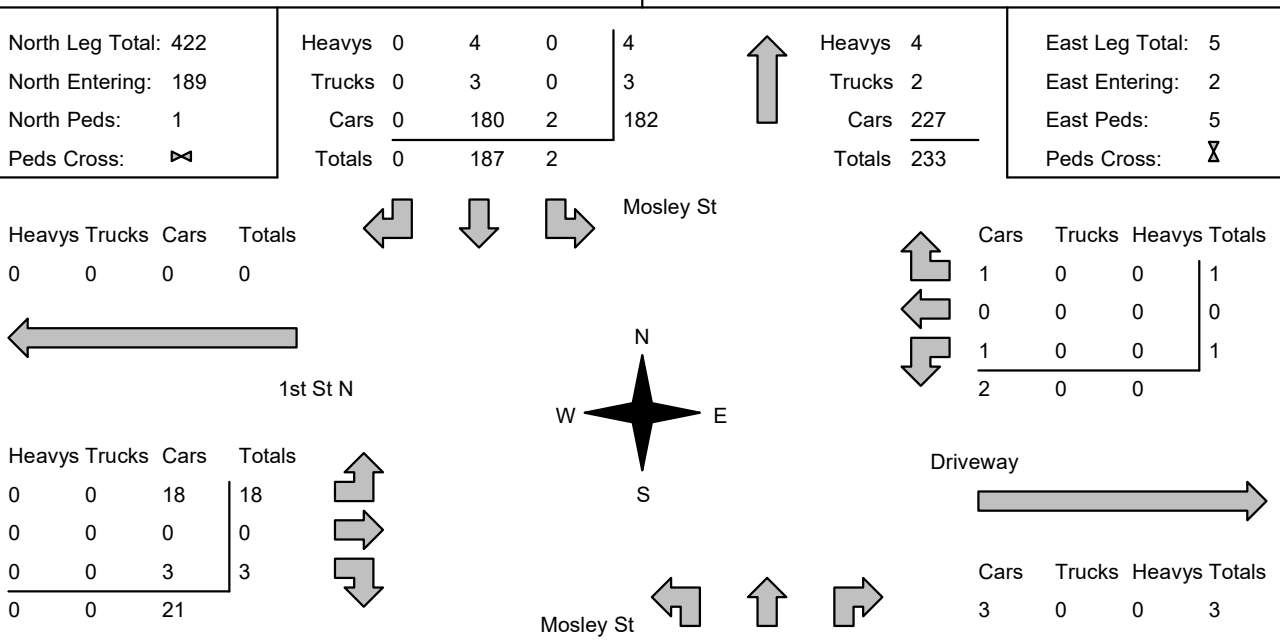
Municipality: Wasaga Beach
Site #: 1909900002
Intersection: Mosley St & 1st St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Mosley St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:00:00
To: 17:00:00

Municipality: Wasaga Beach
Site #: 1909900002
Intersection: Mosley St & 1st St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

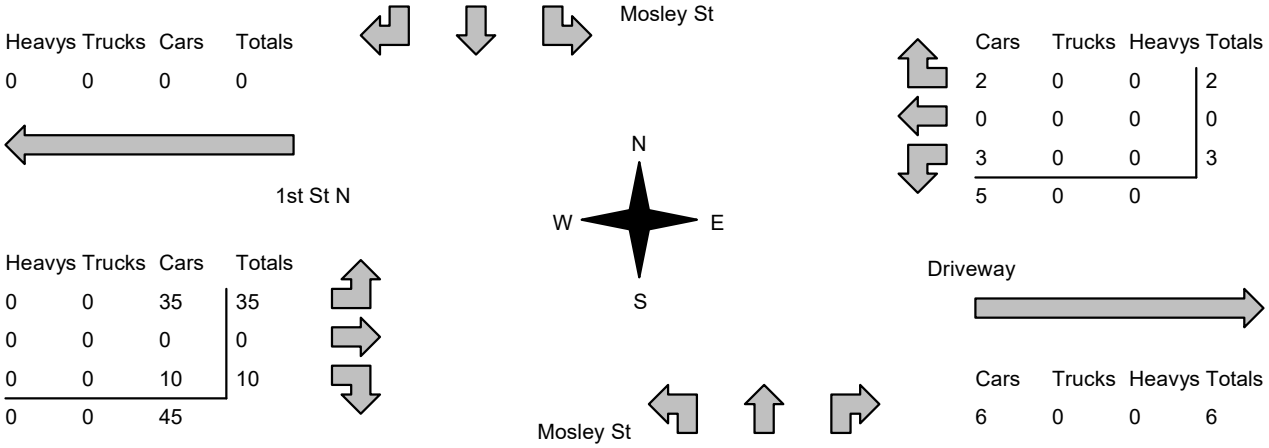
Major Road: Mosley St runs N/S

North Leg Total: 711
North Entering: 278
North Peds: 2
Peds Cross: ⋈

Heavys	0	4	0	4
Trucks	0	1	0	1
Cars	0	268	5	273
Totals	0	273	5	

Heavys	2
Trucks	0
Cars	431
Totals	433

East Leg Total: 11
East Entering: 5
East Peds: 6
Peds Cross: ⧖



Heavys	Trucks	Cars	Totals
0	0	0	0

Cars	Trucks	Heavys	Totals
2	0	0	2
0	0	0	0
3	0	0	3
5	0	0	

Heavys	Trucks	Cars	Totals
0	0	35	35
0	0	0	0
0	0	10	10
0	0	45	

Cars	Trucks	Heavys	Totals
6	0	0	6

Peds Cross: ⧖
West Peds: 1
West Entering: 45
West Leg Total: 45

Cars	281			
Trucks	1			
Heavys	4			
Totals	286			

Cars	0	394	1	395
Trucks	0	0	0	0
Heavys	0	2	0	2
Totals	0	396	1	

Peds Cross: ⋈
South Peds: 2
South Entering: 397
South Leg Total: 683

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Total Count Diagram

Municipality: Wasaga Beach
Site #: 1909900002
Intersection: Mosley St & 1st St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Mosley St runs N/S

North Leg Total: 3009
North Entering: 1300
North Peds: 21
Peds Cross: ⋈

Heavys	0	23	0	23
Trucks	0	8	0	8
Cars	1	1258	10	1269
Totals	1	1289	10	

Heavys	23
Trucks	5
Cars	1681
Totals	1709

East Leg Total: 38
East Entering: 20
East Peds: 29
Peds Cross: ⧖

Mosley St

Heavys	Trucks	Cars	Totals
0	0	1	1

1st St N

Cars	Trucks	Heavys	Totals
6	0	0	6
0	0	0	0
14	0	0	14
20	0	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	149	149
0	0	3	3
0	0	64	64
0	0	216	

Driveway

Cars	Trucks	Heavys	Totals
18	0	0	18

Mosley St

Peds Cross: ⧖
West Peds: 25
West Entering: 216
West Leg Total: 217

Cars	1336			
Trucks	8			
Heavys	23			
Totals	1367			

Cars	0	1526	5	1531
Trucks	0	5	0	5
Heavys	0	23	0	23
Totals	0	1554	5	

Peds Cross: ⋈
South Peds: 20
South Entering: 1559
South Leg Total: 2926

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Mosley St & 1st St N | **Count Date:** 19-Jun-19 | **Municipality:** Wasaga Beach

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*149*	*0*	*149*	*0*
9:00:00	*1*	*222*	*0*	*223*	*0*
10:00:00	*2*	*187*	*0*	*189*	*1*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*1*	*248*	*1*	*250*	*11*
17:00:00	*5*	*273*	*0*	*278*	*2*
18:00:00	*1*	*210*	*0*	*211*	*7*
Totals:	10	1289	1	1300	21

North/South Total Approaches: 2859

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*92*	*0*	*92*	*0*
9:00:00	*0*	*135*	*1*	*136*	*0*
10:00:00	*0*	*214*	*1*	*215*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*365*	*0*	*365*	*7*
17:00:00	*0*	*396*	*1*	*397*	*2*
18:00:00	*0*	*352*	*2*	*354*	*11*
S Totals:	0	1554	5	1559	20

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*0*	*0*	*0*	*0*
9:00:00	*1*	*0*	*0*	*1*	*2*
10:00:00	*1*	*0*	*1*	*2*	*5*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*2*	*0*	*2*	*4*	*8*
17:00:00	*3*	*0*	*2*	*5*	*6*
18:00:00	*7*	*0*	*1*	*8*	*8*
Totals:	14	0	6	20	29

East/West Total Approaches: 236

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*6*	*0*	*5*	*11*	*0*
9:00:00	*14*	*0*	*2*	*16*	*1*
10:00:00	*18*	*0*	*3*	*21*	*4*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*41*	*1*	*24*	*66*	*12*
17:00:00	*35*	*0*	*10*	*45*	*1*
18:00:00	*35*	*2*	*20*	*57*	*7*
W Totals:	149	3	64	216	25

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*6*	*15*	*20*	*0*	*62*	*42*	*62*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900002

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	31	31	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
7:30:00	0	0	56	25	0	0	0	0	1	1	0	0	0	0	2	1	0	0	0	0
7:45:00	0	0	89	33	0	0	0	0	3	2	0	0	0	0	3	1	0	0	0	0
8:00:00	0	0	141	52	0	0	0	0	3	0	0	0	0	0	5	2	0	0	0	0
8:15:00	0	0	193	52	0	0	0	0	4	1	0	0	0	0	6	1	0	0	0	0
8:30:00	0	0	251	58	0	0	0	0	4	0	0	0	0	0	8	2	0	0	0	0
8:45:00	1	1	315	64	0	0	0	0	4	0	0	0	0	0	9	1	0	0	0	0
9:00:00	1	0	358	43	0	0	0	0	4	0	0	0	0	0	9	0	0	0	0	0
9:15:00	1	0	398	40	0	0	0	0	5	1	0	0	0	0	10	1	0	0	0	0
9:30:00	3	2	442	44	0	0	0	0	6	1	0	0	0	0	12	2	0	0	0	0
9:45:00	3	0	503	61	0	0	0	0	6	0	0	0	0	0	13	1	0	0	0	0
10:00:00	3	0	538	35	0	0	0	0	7	1	0	0	0	0	13	0	0	0	1	1
10:15:00	3	0	538	0	0	0	0	0	7	0	0	0	0	0	13	0	0	0	1	0
15:00:00	3	0	538	0	0	0	0	0	7	0	0	0	0	0	13	0	0	0	1	0
15:15:00	4	1	589	51	0	0	0	0	7	0	0	0	0	0	15	2	0	0	2	1
15:30:00	4	0	674	85	0	0	0	0	7	0	0	0	0	0	16	1	0	0	10	8
15:45:00	4	0	724	50	1	1	0	0	7	0	0	0	0	0	16	0	0	0	10	0
16:00:00	4	0	781	57	1	0	0	0	7	0	0	0	0	0	18	2	0	0	12	2
16:15:00	5	1	843	62	1	0	0	0	7	0	0	0	0	0	18	0	0	0	12	0
16:30:00	6	1	902	59	1	0	0	0	7	0	0	0	0	0	20	2	0	0	14	2
16:45:00	6	0	987	85	1	0	0	0	7	0	0	0	0	0	22	2	0	0	14	0
17:00:00	9	3	1049	62	1	0	0	0	8	1	0	0	0	0	22	0	0	0	14	0
17:15:00	9	0	1094	45	1	0	0	0	8	0	0	0	0	0	22	0	0	0	16	2
17:30:00	9	0	1159	65	1	0	0	0	8	0	0	0	0	0	23	1	0	0	16	0
17:45:00	10	1	1216	57	1	0	0	0	8	0	0	0	0	0	23	0	0	0	17	1
18:00:00	10	0	1258	42	1	0	0	0	8	0	0	0	0	0	23	0	0	0	21	4
18:15:00	10	0	1258	0	1	0	0	0	8	0	0	0	0	0	23	0	0	0	21	0
18:15:15	10	0	1258	0	1	0	0	0	8	0	0	0	0	0	23	0	0	0	21	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900002

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
9:00:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
9:15:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2
9:30:00	2	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0
9:45:00	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
10:00:00	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	3
10:15:00	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
15:00:00	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
15:15:00	2	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	8	1
15:30:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
15:45:00	3	1	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	15	7
16:00:00	4	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0
16:15:00	5	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	17	2
16:30:00	5	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	19	2
16:45:00	6	1	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	19	0
17:00:00	7	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	21	2
17:15:00	10	3	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	27	6
17:30:00	10	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	28	1
17:45:00	12	2	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	29	1
18:00:00	14	2	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0
18:15:00	14	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0
18:15:15	14	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900002

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	9	9	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
7:30:00	0	0	35	26	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0
7:45:00	0	0	58	23	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0
8:00:00	0	0	86	28	0	0	0	0	0	0	0	0	0	0	6	2	0	0	0	0
8:15:00	0	0	114	28	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0
8:30:00	0	0	151	37	1	1	0	0	0	0	0	0	0	0	8	2	0	0	0	0
8:45:00	0	0	181	30	1	0	0	0	0	0	0	0	0	0	9	1	0	0	0	0
9:00:00	0	0	217	36	1	0	0	0	0	0	0	0	0	0	10	1	0	0	0	0
9:15:00	0	0	268	51	1	0	0	0	1	1	0	0	0	0	12	2	0	0	0	0
9:30:00	0	0	310	42	1	0	0	0	1	0	0	0	0	0	12	0	0	0	0	0
9:45:00	0	0	368	58	2	1	0	0	2	1	0	0	0	0	13	1	0	0	0	0
10:00:00	0	0	425	57	2	0	0	0	2	0	0	0	0	0	14	1	0	0	0	0
10:15:00	0	0	425	0	2	0	0	0	2	0	0	0	0	0	14	0	0	0	0	0
15:00:00	0	0	425	0	2	0	0	0	2	0	0	0	0	0	14	0	0	0	0	0
15:15:00	0	0	504	79	2	0	0	0	3	1	0	0	0	0	15	1	0	0	0	0
15:30:00	0	0	595	91	2	0	0	0	4	1	0	0	0	0	16	1	0	0	3	3
15:45:00	0	0	674	79	2	0	0	0	4	0	0	0	0	0	18	2	0	0	7	4
16:00:00	0	0	781	107	2	0	0	0	5	1	0	0	0	0	20	2	0	0	7	0
16:15:00	0	0	871	90	2	0	0	0	5	0	0	0	0	0	21	1	0	0	7	0
16:30:00	0	0	973	102	3	1	0	0	5	0	0	0	0	0	22	1	0	0	7	0
16:45:00	0	0	1066	93	3	0	0	0	5	0	0	0	0	0	22	0	0	0	9	2
17:00:00	0	0	1175	109	3	0	0	0	5	0	0	0	0	0	22	0	0	0	9	0
17:15:00	0	0	1273	98	4	1	0	0	5	0	0	0	0	0	22	0	0	0	11	2
17:30:00	0	0	1353	80	4	0	0	0	5	0	0	0	0	0	23	1	0	0	14	3
17:45:00	0	0	1444	91	4	0	0	0	5	0	0	0	0	0	23	0	0	0	20	6
18:00:00	0	0	1526	82	5	1	0	0	5	0	0	0	0	0	23	0	0	0	20	0
18:15:00	0	0	1526	0	5	0	0	0	5	0	0	0	0	0	23	0	0	0	20	0
18:15:15	0	0	1526	0	5	0	0	0	5	0	0	0	0	0	23	0	0	0	20	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900002

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	3	2	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	6	3	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	9	3	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	12	3	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	17	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
9:00:00	20	3	0	0	7	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9:15:00	25	5	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9:30:00	26	1	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
9:45:00	30	4	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	4	2
10:00:00	38	8	0	0	10	2	0	0	0	0	0	0	0	0	0	0	0	0	5	1
10:15:00	38	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
15:00:00	38	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
15:15:00	44	6	0	0	15	5	0	0	0	0	0	0	0	0	0	0	0	0	9	4
15:30:00	57	13	1	1	22	7	0	0	0	0	0	0	0	0	0	0	0	0	13	4
15:45:00	72	15	1	0	28	6	0	0	0	0	0	0	0	0	0	0	0	0	13	0
16:00:00	79	7	1	0	34	6	0	0	0	0	0	0	0	0	0	0	0	0	17	4
16:15:00	89	10	1	0	38	4	0	0	0	0	0	0	0	0	0	0	0	0	18	1
16:30:00	95	6	1	0	40	2	0	0	0	0	0	0	0	0	0	0	0	0	18	0
16:45:00	100	5	1	0	41	1	0	0	0	0	0	0	0	0	0	0	0	0	18	0
17:00:00	114	14	1	0	44	3	0	0	0	0	0	0	0	0	0	0	0	0	18	0
17:15:00	122	8	3	2	46	2	0	0	0	0	0	0	0	0	0	0	0	0	20	2
17:30:00	128	6	3	0	49	3	0	0	0	0	0	0	0	0	0	0	0	0	23	3
17:45:00	141	13	3	0	54	5	0	0	0	0	0	0	0	0	0	0	0	0	24	1
18:00:00	149	8	3	0	64	10	0	0	0	0	0	0	0	0	0	0	0	0	25	1
18:15:00	149	0	3	0	64	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
18:15:15	149	0	3	0	64	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 9:00:00
To: 10:00:00

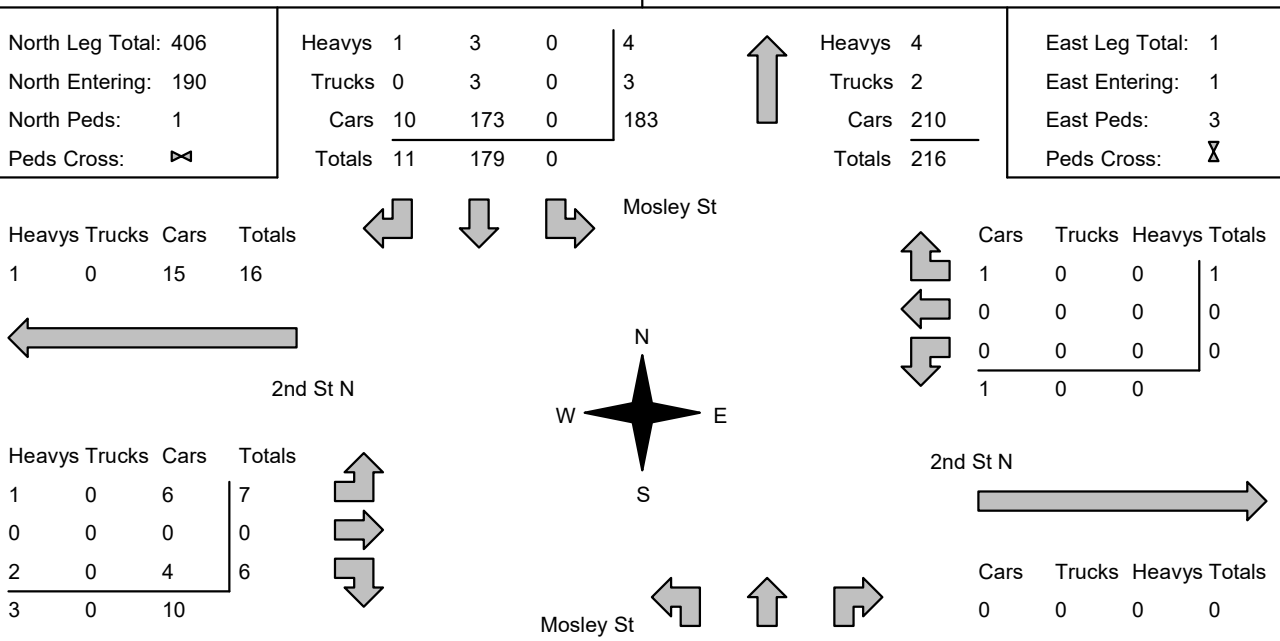
Municipality: Wasaga Beach
Site #: 1909900003
Intersection: Mosley St & 2nd St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Mosley St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:45:00
To: 16:45:00

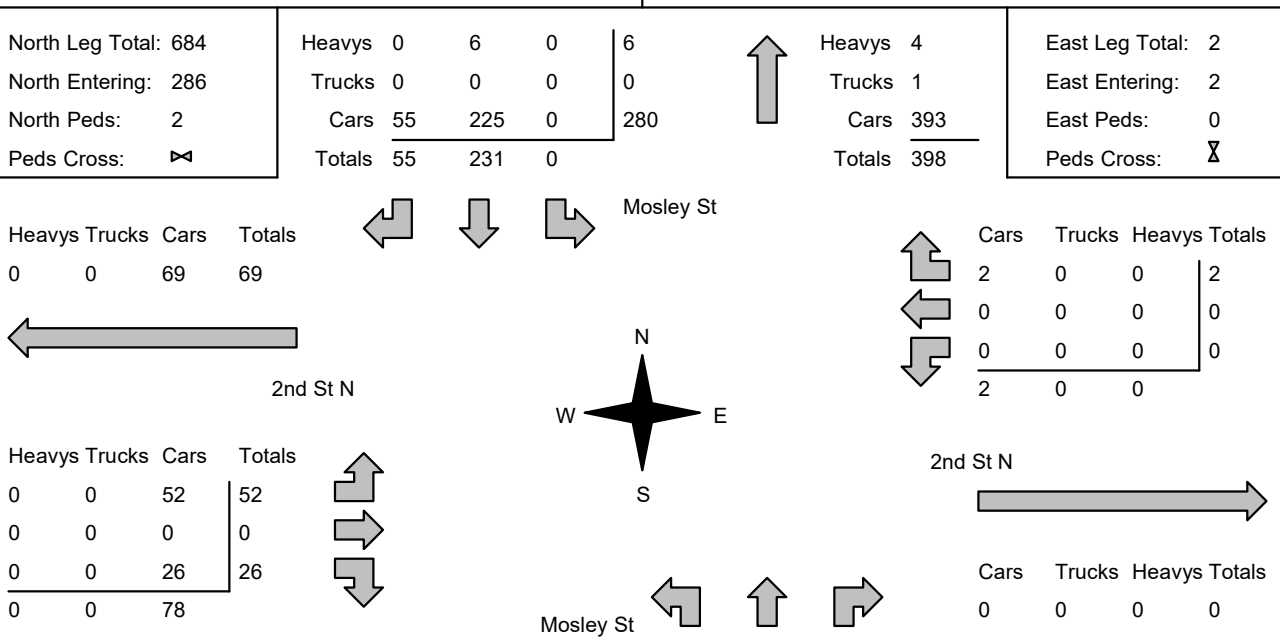
Municipality: Wasaga Beach
Site #: 1909900003
Intersection: Mosley St & 2nd St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Mosley St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Total Count Diagram

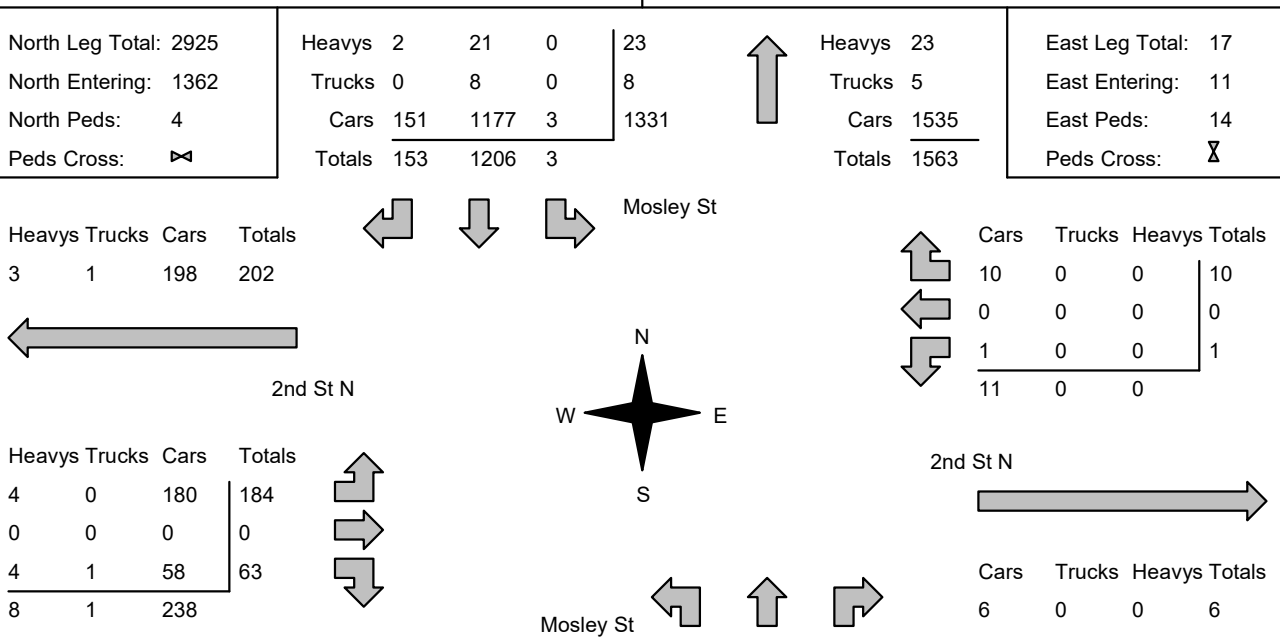
Municipality: Wasaga Beach
Site #: 1909900003
Intersection: Mosley St & 2nd St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Mosley St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.
Traffic Count Summary

Intersection: Mosley St & 2nd St N | **Count Date:** 19-Jun-19 | **Municipality:** Wasaga Beach

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*153*	*0*	*153*	*0*
9:00:00	*0*	*222*	*2*	*224*	*0*
10:00:00	*0*	*179*	*11*	*190*	*1*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*1*	*223*	*49*	*273*	*1*
17:00:00	*1*	*224*	*60*	*285*	*1*
18:00:00	*1*	*205*	*31*	*237*	*1*
Totals:	3	1206	153	1362	4

North/South Total Approaches: *0*, *246*, *360*, *403*, *0*, *601*, *631*, *542*, 2783

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*2*	*89*	*2*	*93*	*0*
9:00:00	*3*	*133*	*0*	*136*	*0*
10:00:00	*5*	*208*	*0*	*213*	*1*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*18*	*309*	*1*	*328*	*0*
17:00:00	*11*	*335*	*0*	*346*	*1*
18:00:00	*10*	*295*	*0*	*305*	*0*
S Totals:	49	1369	3	1421	2

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*0*	*1*	*1*	*0*
9:00:00	*0*	*0*	*0*	*0*	*2*
10:00:00	*0*	*0*	*1*	*1*	*3*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*1*	*0*	*3*	*4*	*1*
17:00:00	*0*	*0*	*3*	*3*	*0*
18:00:00	*0*	*0*	*2*	*2*	*8*
Totals:	1	0	10	11	14

East/West Total Approaches: *0*, *5*, *5*, *14*, *0*, *82*, *84*, *68*, 258

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*2*	*0*	*2*	*4*	*0*
9:00:00	*4*	*0*	*1*	*5*	*0*
10:00:00	*7*	*0*	*6*	*13*	*2*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*54*	*0*	*24*	*78*	*11*
17:00:00	*60*	*0*	*21*	*81*	*5*
18:00:00	*57*	*0*	*9*	*66*	*5*
W Totals:	184	0	63	247	23

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*2*	*4*	*9*	*0*	*56*	*62*	*58*

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900003

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	32	32	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
7:30:00	0	0	58	26	0	0	0	0	1	1	0	0	0	0	2	1	0	0	0	0
7:45:00	0	0	92	34	0	0	0	0	3	2	0	0	0	0	3	1	0	0	0	0
8:00:00	0	0	145	53	0	0	0	0	3	0	0	0	0	0	5	2	0	0	0	0
8:15:00	0	0	196	51	1	1	0	0	4	1	0	0	0	0	6	1	0	0	0	0
8:30:00	0	0	251	55	2	1	0	0	4	0	0	0	0	0	8	2	0	0	0	0
8:45:00	0	0	315	64	2	0	0	0	4	0	0	0	0	0	9	1	0	0	0	0
9:00:00	0	0	362	47	2	0	0	0	4	0	0	0	0	0	9	0	0	0	0	0
9:15:00	0	0	402	40	2	0	0	0	5	1	0	0	0	0	9	0	1	1	0	0
9:30:00	0	0	444	42	4	2	0	0	6	1	0	0	0	0	11	2	1	0	0	0
9:45:00	0	0	501	57	8	4	0	0	6	0	0	0	0	0	12	1	1	0	0	0
10:00:00	0	0	535	34	12	4	0	0	7	1	0	0	0	0	12	0	1	0	1	1
10:15:00	0	0	535	0	12	0	0	0	7	0	0	0	0	0	12	0	1	0	1	0
15:00:00	0	0	535	0	12	0	0	0	7	0	0	0	0	0	12	0	1	0	1	0
15:15:00	0	0	582	47	20	8	0	0	7	0	0	0	0	0	14	2	1	0	1	0
15:30:00	0	0	660	78	33	13	0	0	7	0	0	0	0	0	14	0	2	1	1	0
15:45:00	1	1	701	41	48	15	0	0	7	0	0	0	0	0	14	0	2	0	1	0
16:00:00	1	0	754	53	60	12	0	0	7	0	0	0	0	0	16	2	2	0	2	1
16:15:00	1	0	806	52	75	15	0	0	7	0	0	0	0	0	16	0	2	0	2	0
16:30:00	1	0	855	49	87	12	0	0	7	0	0	0	0	0	18	2	2	0	2	0
16:45:00	1	0	926	71	103	16	0	0	7	0	0	0	0	0	20	2	2	0	3	1
17:00:00	2	1	973	47	120	17	0	0	8	1	0	0	0	0	20	0	2	0	3	0
17:15:00	2	0	1016	43	127	7	0	0	8	0	0	0	0	0	20	0	2	0	3	0
17:30:00	3	1	1075	59	134	7	0	0	8	0	0	0	0	0	21	1	2	0	3	0
17:45:00	3	0	1130	55	143	9	0	0	8	0	0	0	0	0	21	0	2	0	4	1
18:00:00	3	0	1177	47	151	8	0	0	8	0	0	0	0	0	21	0	2	0	4	0
18:15:00	3	0	1177	0	151	0	0	0	8	0	0	0	0	0	21	0	2	0	4	0
18:15:15	3	0	1177	0	151	0	0	0	8	0	0	0	0	0	21	0	2	0	4	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900003

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
9:00:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:15:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:30:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:45:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
10:00:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3
10:15:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
15:00:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
15:15:00	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1
15:30:00	1	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	6	0
15:45:00	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
16:00:00	1	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0
16:15:00	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
16:30:00	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
16:45:00	1	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0
17:00:00	1	0	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	0	6	0
17:15:00	1	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	13	7
17:30:00	1	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
17:45:00	1	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
18:00:00	1	0	0	0	10	2	0	0	0	0	0	0	0	0	0	0	0	0	14	1
18:15:00	1	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
18:15:15	1	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900003

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	34	25	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
7:45:00	0	0	57	23	2	1	0	0	0	0	0	0	0	0	2	1	0	0	0	0
8:00:00	2	2	85	28	2	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0
8:15:00	4	2	112	27	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
8:30:00	4	0	148	36	2	0	0	0	0	0	0	0	0	0	6	2	0	0	0	0
8:45:00	4	0	179	31	2	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0
9:00:00	4	0	214	35	2	0	1	1	0	0	0	0	0	0	8	1	0	0	0	0
9:15:00	5	1	265	51	2	0	1	0	1	1	0	0	0	0	9	1	0	0	0	0
9:30:00	5	0	305	40	2	0	1	0	1	0	0	0	0	0	9	0	0	0	0	0
9:45:00	5	0	360	55	2	0	1	0	2	1	0	0	0	0	10	1	0	0	1	1
10:00:00	9	4	417	57	2	0	1	0	2	0	0	0	0	0	11	1	0	0	1	0
10:15:00	9	0	417	0	2	0	1	0	2	0	0	0	0	0	11	0	0	0	1	0
15:00:00	9	0	417	0	2	0	1	0	2	0	0	0	0	0	11	0	0	0	1	0
15:15:00	12	3	482	65	3	1	1	0	3	1	0	0	0	0	11	0	0	0	1	0
15:30:00	15	3	556	74	3	0	1	0	4	1	0	0	0	0	12	1	0	0	1	0
15:45:00	22	7	622	66	3	0	1	0	4	0	0	0	0	0	14	2	0	0	1	0
16:00:00	27	5	718	96	3	0	1	0	5	1	0	0	0	0	16	2	0	0	1	0
16:15:00	31	4	795	77	3	0	1	0	5	0	0	0	0	0	17	1	0	0	1	0
16:30:00	33	2	882	87	3	0	1	0	5	0	0	0	0	0	18	1	0	0	2	1
16:45:00	36	3	961	79	3	0	1	0	5	0	0	0	0	0	18	0	0	0	2	0
17:00:00	37	1	1051	90	3	0	1	0	5	0	0	0	1	1	18	0	0	0	2	0
17:15:00	40	3	1128	77	3	0	1	0	5	0	0	0	1	0	18	0	0	0	2	0
17:30:00	45	5	1200	72	3	0	1	0	5	0	0	0	1	0	19	1	0	0	2	0
17:45:00	46	1	1276	76	3	0	1	0	5	0	0	0	1	0	19	0	0	0	2	0
18:00:00	47	1	1345	69	3	0	1	0	5	0	0	0	1	0	19	0	0	0	2	0
18:15:00	47	0	1345	0	3	0	1	0	5	0	0	0	1	0	19	0	0	0	2	0
18:15:15	47	0	1345	0	3	0	1	0	5	0	0	0	1	0	19	0	0	0	2	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900003

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	1	1	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
7:45:00	0	0	0	0	1	1	0	0	0	0	0	0	2	0	0	0	1	0	0	0
8:00:00	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
8:15:00	1	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
8:30:00	3	2	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
8:45:00	3	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0
9:00:00	4	1	0	0	2	1	0	0	0	0	0	0	2	0	0	0	1	0	0	0
9:15:00	4	0	0	0	4	2	0	0	0	0	0	0	3	1	0	0	2	1	0	0
9:30:00	5	1	0	0	5	1	0	0	0	0	0	0	3	0	0	0	2	0	0	0
9:45:00	9	4	0	0	6	1	0	0	0	0	0	0	3	0	0	0	3	1	2	2
10:00:00	10	1	0	0	6	0	0	0	0	0	0	0	3	0	0	0	3	0	2	0
10:15:00	10	0	0	0	6	0	0	0	0	0	0	0	3	0	0	0	3	0	2	0
15:00:00	10	0	0	0	6	0	0	0	0	0	0	0	3	0	0	0	3	0	2	0
15:15:00	24	14	0	0	8	2	0	0	0	0	0	0	4	1	0	0	4	1	3	1
15:30:00	39	15	0	0	13	5	0	0	0	0	0	0	4	0	0	0	4	0	4	1
15:45:00	53	14	0	0	21	8	0	0	0	0	1	1	4	0	0	0	4	0	6	2
16:00:00	63	10	0	0	28	7	0	0	0	0	1	0	4	0	0	0	4	0	13	7
16:15:00	76	13	0	0	33	5	0	0	0	0	1	0	4	0	0	0	4	0	16	3
16:30:00	92	16	0	0	40	7	0	0	0	0	1	0	4	0	0	0	4	0	16	0
16:45:00	105	13	0	0	47	7	0	0	0	0	1	0	4	0	0	0	4	0	16	0
17:00:00	123	18	0	0	49	2	0	0	0	0	1	0	4	0	0	0	4	0	18	2
17:15:00	145	22	0	0	54	5	0	0	0	0	1	0	4	0	0	0	4	0	19	1
17:30:00	153	8	0	0	55	1	0	0	0	0	1	0	4	0	0	0	4	0	21	2
17:45:00	168	15	0	0	57	2	0	0	0	0	1	0	4	0	0	0	4	0	23	2
18:00:00	180	12	0	0	58	1	0	0	0	0	1	0	4	0	0	0	4	0	23	0
18:15:00	180	0	0	0	58	0	0	0	0	0	1	0	4	0	0	0	4	0	23	0
18:15:15	180	0	0	0	58	0	0	0	0	0	1	0	4	0	0	0	4	0	23	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 9:00:00
To: 10:00:00

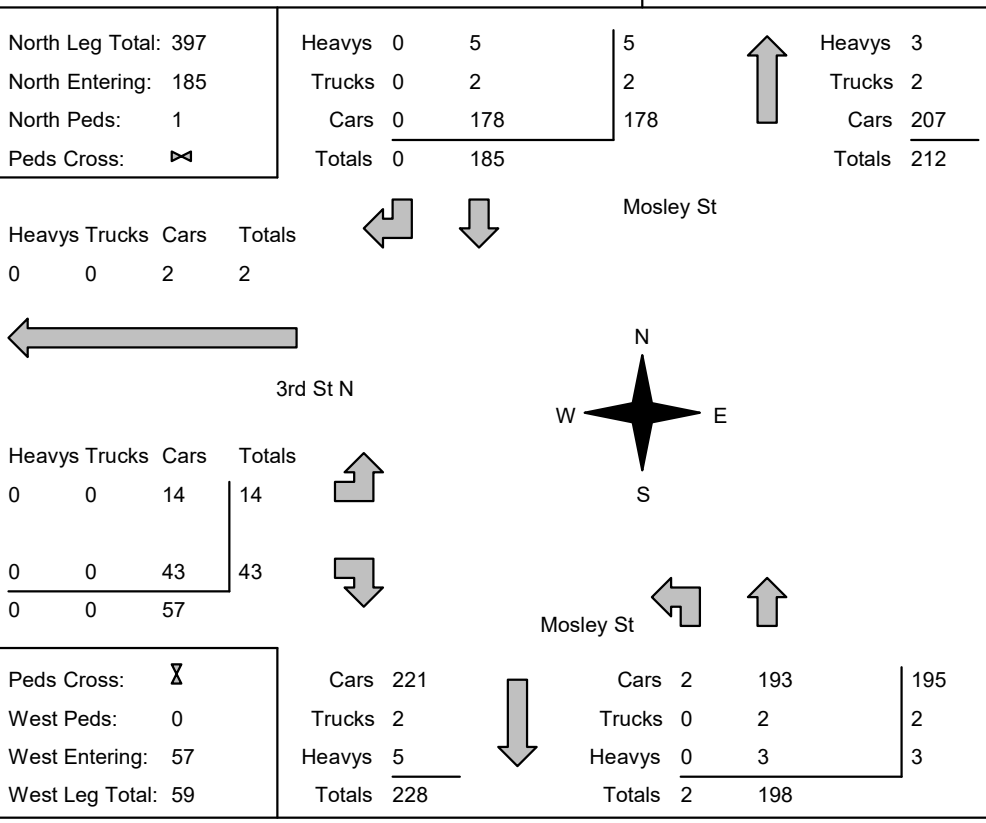
Municipality: Wasaga Beach
Site #: 1909900004
Intersection: Mosley St & 3rd St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Mosley St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:15:00
To: 16:15:00

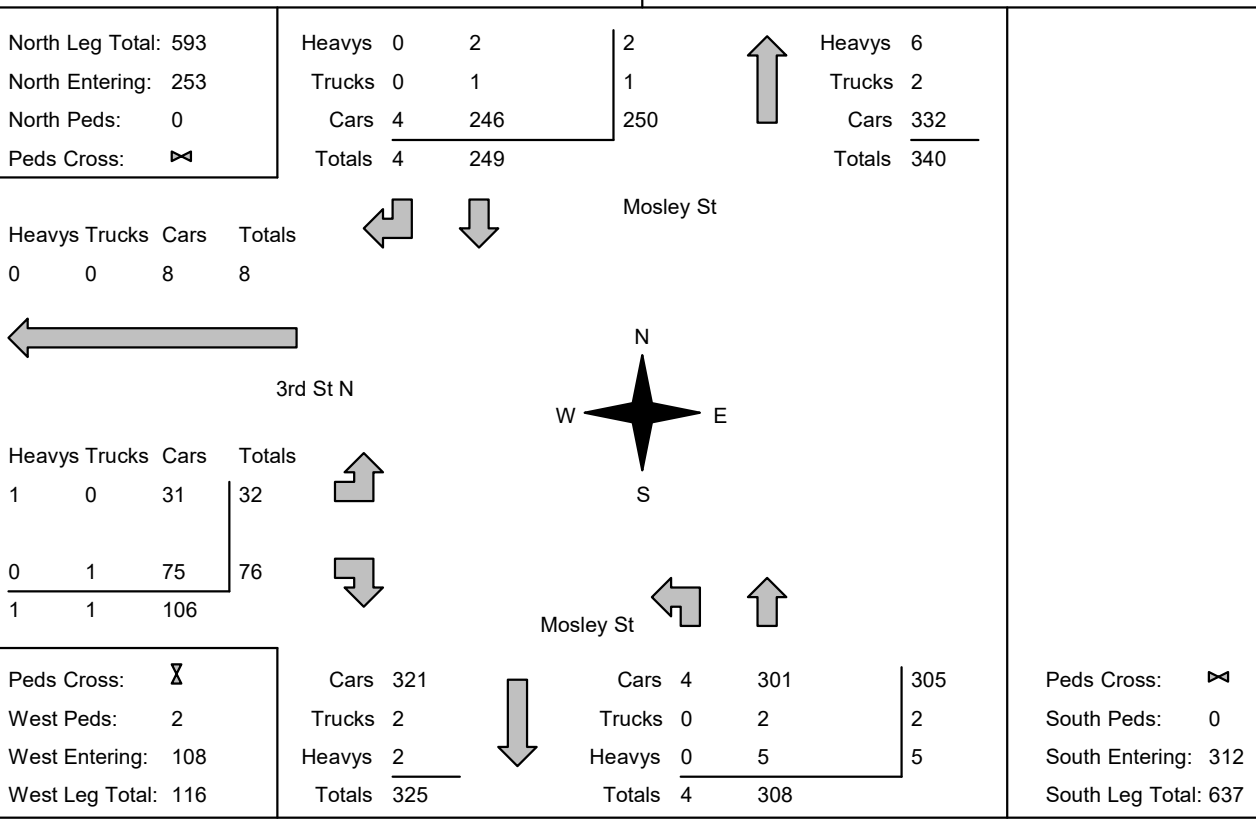
Municipality: Wasaga Beach
Site #: 1909900004
Intersection: Mosley St & 3rd St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Mosley St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Total Count Diagram

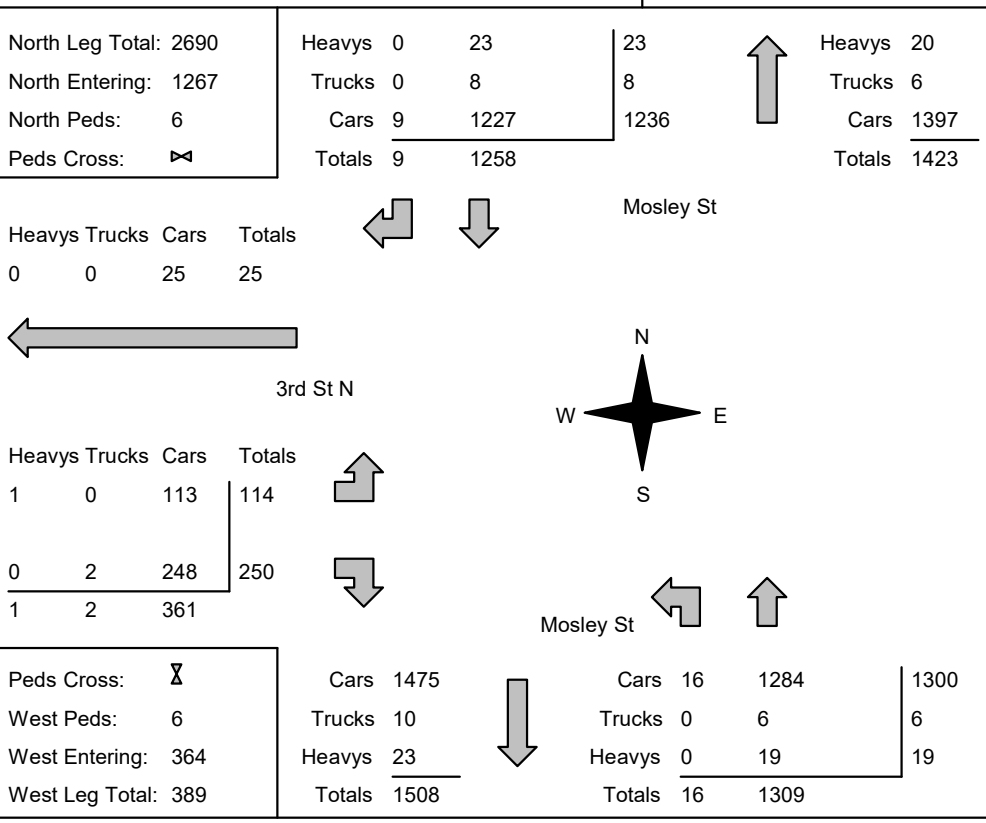
Municipality: Wasaga Beach
Site #: 1909900004
Intersection: Mosley St & 3rd St N
TFR File #: 1
Count date: 19-Jun-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Mosley St runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Mosley St & 3rd St N | **Count Date:** 19-Jun-19 | **Municipality:** Wasaga Beach

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*154*	*1*	*155*	*0*
9:00:00	*0*	*222*	*1*	*223*	*0*
10:00:00	*0*	*185*	*0*	*185*	*1*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*244*	*3*	*247*	*1*
17:00:00	*0*	*241*	*2*	*243*	*1*
18:00:00	*0*	*212*	*2*	*214*	*3*
Totals:	0	1258	9	1267	6

North/South Total Approaches: 2592

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*1*	*89*	*0*	*90*	*0*
9:00:00	*2*	*129*	*0*	*131*	*0*
10:00:00	*2*	*198*	*0*	*200*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*5*	*293*	*0*	*298*	*0*
17:00:00	*3*	*324*	*0*	*327*	*0*
18:00:00	*3*	*276*	*0*	*279*	*0*
S Totals:	16	1309	0	1325	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*0*	*0*	*0*	*0*
9:00:00	*0*	*0*	*0*	*0*	*0*
10:00:00	*0*	*0*	*0*	*0*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*0*	*0*	*0*	*0*	*0*
18:00:00	*0*	*0*	*0*	*0*	*0*
Totals:	0	0	0	0	0

East/West Total Approaches: 364

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*5*	*0*	*17*	*22*	*0*
9:00:00	*7*	*0*	*18*	*25*	*2*
10:00:00	*14*	*0*	*43*	*57*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*36*	*0*	*70*	*106*	*2*
17:00:00	*23*	*0*	*50*	*73*	*2*
18:00:00	*29*	*0*	*52*	*81*	*0*
W Totals:	114	0	250	364	6

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*5*	*7*	*15*	*0*	*37*	*24*	*32*

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900004

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	32	32	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
7:30:00	0	0	58	26	0	0	0	0	1	1	0	0	0	0	3	1	0	0	0	0
7:45:00	0	0	92	34	1	1	0	0	3	2	0	0	0	0	4	1	0	0	0	0
8:00:00	0	0	145	53	1	0	0	0	3	0	0	0	0	0	6	2	0	0	0	0
8:15:00	0	0	197	52	1	0	0	0	4	1	0	0	0	0	7	1	0	0	0	0
8:30:00	0	0	252	55	1	0	0	0	4	0	0	0	0	0	9	2	0	0	0	0
8:45:00	0	0	314	62	2	1	0	0	4	0	0	0	0	0	10	1	0	0	0	0
9:00:00	0	0	362	48	2	0	0	0	4	0	0	0	0	0	10	0	0	0	0	0
9:15:00	0	0	404	42	2	0	0	0	5	1	0	0	0	0	11	1	0	0	0	0
9:30:00	0	0	448	44	2	0	0	0	5	0	0	0	0	0	13	2	0	0	0	0
9:45:00	0	0	506	58	2	0	0	0	5	0	0	0	0	0	15	2	0	0	0	0
10:00:00	0	0	540	34	2	0	0	0	6	1	0	0	0	0	15	0	0	0	1	1
10:15:00	0	0	540	0	2	0	0	0	6	0	0	0	0	0	15	0	0	0	1	0
15:00:00	0	0	540	0	2	0	0	0	6	0	0	0	0	0	15	0	0	0	1	0
15:15:00	0	0	590	50	2	0	0	0	6	0	0	0	0	0	16	1	0	0	2	1
15:30:00	0	0	671	81	4	2	0	0	6	0	0	0	0	0	16	0	0	0	2	0
15:45:00	0	0	720	49	5	1	0	0	7	1	0	0	0	0	16	0	0	0	2	0
16:00:00	0	0	780	60	5	0	0	0	7	0	0	0	0	0	18	2	0	0	2	0
16:15:00	0	0	836	56	6	1	0	0	7	0	0	0	0	0	18	0	0	0	2	0
16:30:00	0	0	891	55	6	0	0	0	7	0	0	0	0	0	20	2	0	0	3	1
16:45:00	0	0	968	77	7	1	0	0	7	0	0	0	0	0	22	2	0	0	3	0
17:00:00	0	0	1016	48	7	0	0	0	8	1	0	0	0	0	22	0	0	0	3	0
17:15:00	0	0	1063	47	8	1	0	0	8	0	0	0	0	0	22	0	0	0	6	3
17:30:00	0	0	1123	60	8	0	0	0	8	0	0	0	0	0	23	1	0	0	6	0
17:45:00	0	0	1179	56	9	1	0	0	8	0	0	0	0	0	23	0	0	0	6	0
18:00:00	0	0	1227	48	9	0	0	0	8	0	0	0	0	0	23	0	0	0	6	0
18:15:00	0	0	1227	0	9	0	0	0	8	0	0	0	0	0	23	0	0	0	6	0
18:15:15	0	0	1227	0	9	0	0	0	8	0	0	0	0	0	23	0	0	0	6	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900004

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900004

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	32	24	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
7:45:00	1	1	57	25	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
8:00:00	1	0	85	28	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0
8:15:00	2	1	113	28	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
8:30:00	2	0	146	33	0	0	0	0	0	0	0	0	0	0	6	2	0	0	0	0
8:45:00	2	0	174	28	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0
9:00:00	3	1	209	35	0	0	0	0	1	1	0	0	0	0	8	1	0	0	0	0
9:15:00	3	0	259	50	0	0	0	0	2	1	0	0	0	0	9	1	0	0	0	0
9:30:00	3	0	297	38	0	0	0	0	2	0	0	0	0	0	10	1	0	0	0	0
9:45:00	3	0	346	49	0	0	0	0	3	1	0	0	0	0	10	0	0	0	0	0
10:00:00	5	2	402	56	0	0	0	0	3	0	0	0	0	0	11	1	0	0	0	0
10:15:00	5	0	402	0	0	0	0	0	3	0	0	0	0	0	11	0	0	0	0	0
15:00:00	5	0	402	0	0	0	0	0	3	0	0	0	0	0	11	0	0	0	0	0
15:15:00	7	2	463	61	0	0	0	0	4	1	0	0	0	0	11	0	0	0	0	0
15:30:00	9	2	529	66	0	0	0	0	5	1	0	0	0	0	12	1	0	0	0	0
15:45:00	9	0	596	67	0	0	0	0	5	0	0	0	0	0	13	1	0	0	0	0
16:00:00	10	1	688	92	0	0	0	0	6	1	0	0	0	0	15	2	0	0	0	0
16:15:00	11	1	764	76	0	0	0	0	6	0	0	0	0	0	16	1	0	0	0	0
16:30:00	12	1	851	87	0	0	0	0	6	0	0	0	0	0	17	1	0	0	0	0
16:45:00	12	0	927	76	0	0	0	0	6	0	0	0	0	0	17	0	0	0	0	0
17:00:00	13	1	1009	82	0	0	0	0	6	0	0	0	0	0	18	1	0	0	0	0
17:15:00	15	2	1082	73	0	0	0	0	6	0	0	0	0	0	18	0	0	0	0	0
17:30:00	15	0	1153	71	0	0	0	0	6	0	0	0	0	0	19	1	0	0	0	0
17:45:00	16	1	1223	70	0	0	0	0	6	0	0	0	0	0	19	0	0	0	0	0
18:00:00	16	0	1284	61	0	0	0	0	6	0	0	0	0	0	19	0	0	0	0	0
18:15:00	16	0	1284	0	0	0	0	0	6	0	0	0	0	0	19	0	0	0	0	0
18:15:15	16	0	1284	0	0	0	0	0	6	0	0	0	0	0	19	0	0	0	0	0

Accu-Traffic Inc.

Count Date: 19-Jun-19 Site #: 1909900004

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	3	2	0	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	3	0	0	0	10	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	5	2	0	0	16	6	0	0	0	0	1	1	0	0	0	0	0	0	0	0
8:15:00	6	1	0	0	19	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30:00	9	3	0	0	24	5	0	0	0	0	1	0	0	0	0	0	0	0	2	2
8:45:00	12	3	0	0	29	5	0	0	0	0	1	0	0	0	0	0	0	0	2	0
9:00:00	12	0	0	0	34	5	0	0	0	0	1	0	0	0	0	0	0	0	2	0
9:15:00	15	3	0	0	42	8	0	0	0	0	1	0	0	0	0	0	0	0	2	0
9:30:00	17	2	0	0	55	13	0	0	0	0	1	0	0	0	0	0	0	0	2	0
9:45:00	22	5	0	0	59	4	0	0	0	0	1	0	0	0	0	0	0	0	2	0
10:00:00	26	4	0	0	77	18	0	0	0	0	1	0	0	0	0	0	0	0	2	0
10:15:00	26	0	0	0	77	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
15:00:00	26	0	0	0	77	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
15:15:00	35	9	0	0	88	11	0	0	0	0	1	0	0	0	0	0	0	0	3	1
15:30:00	46	11	0	0	106	18	0	0	0	0	1	0	0	0	0	0	0	0	4	1
15:45:00	53	7	0	0	130	24	0	0	0	0	2	1	1	1	0	0	0	0	4	0
16:00:00	61	8	0	0	146	16	0	0	0	0	2	0	1	0	0	0	0	0	4	0
16:15:00	66	5	0	0	163	17	0	0	0	0	2	0	1	0	0	0	0	0	5	1
16:30:00	69	3	0	0	178	15	0	0	0	0	2	0	1	0	0	0	0	0	5	0
16:45:00	75	6	0	0	184	6	0	0	0	0	2	0	1	0	0	0	0	0	5	0
17:00:00	84	9	0	0	196	12	0	0	0	0	2	0	1	0	0	0	0	0	6	1
17:15:00	91	7	0	0	209	13	0	0	0	0	2	0	1	0	0	0	0	0	6	0
17:30:00	98	7	0	0	225	16	0	0	0	0	2	0	1	0	0	0	0	0	6	0
17:45:00	105	7	0	0	235	10	0	0	0	0	2	0	1	0	0	0	0	0	6	0
18:00:00	113	8	0	0	248	13	0	0	0	0	2	0	1	0	0	0	0	0	6	0
18:15:00	113	0	0	0	248	0	0	0	0	0	2	0	1	0	0	0	0	0	6	0
18:15:15	113	0	0	0	248	0	0	0	0	0	2	0	1	0	0	0	0	0	6	0

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 9:00:00
To: 10:00:00

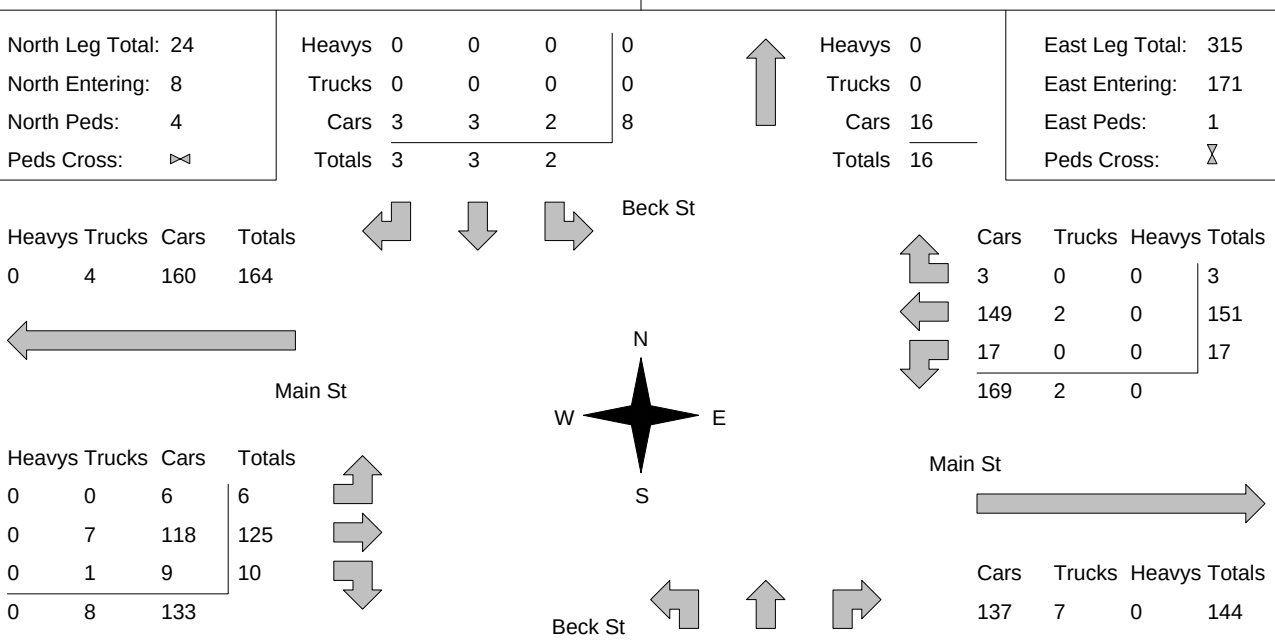
Municipality: Wasaga Beach
Site #: 1712500014
Intersection: Main St & Beck St
TFR File #: 1
Count date: 29-Jun-17

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Main St runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:30:00
To: 16:30:00

Municipality: Wasaga Beach
Site #: 1712500014
Intersection: Main St & Beck St
TFR File #: 1
Count date: 29-Jun-17

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

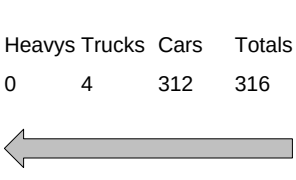
Major Road: Main St runs W/E

North Leg Total:	43			
North Entering:	15			
North Peds:	43			
Peds Cross:	⋈			

Heavys	0	0	0	0
Trucks	0	1	0	1
Cars	3	8	3	14
Totals	3	9	3	

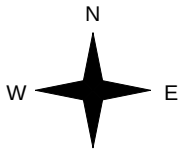
Heavys	0
Trucks	0
Cars	28
Totals	28

East Leg Total:	598
East Entering:	329
East Peds:	0
Peds Cross:	⧖



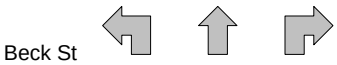
Heavys	Trucks	Cars	Totals
0	4	312	316

Cars	Trucks	Heavys	Totals
5	0	0	5
298	1	0	299
25	0	0	25
328	1	0	



Heavys	Trucks	Cars	Totals
0	0	7	7
0	7	237	244
0	2	9	11
0	9	253	

Cars	Trucks	Heavys	Totals
260	9	0	269



Peds Cross:	⧖
West Peds:	0
West Entering:	262
West Leg Total:	578

Cars	42
Trucks	3
Heavys	0
Totals	45

Cars	11	16	20	47
Trucks	3	0	2	5
Heavys	0	0	0	0
Totals	14	16	22	

Peds Cross:	⋈
South Peds:	10
South Entering:	52
South Leg Total:	97

Comments

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 9:00:00
To: 10:00:00

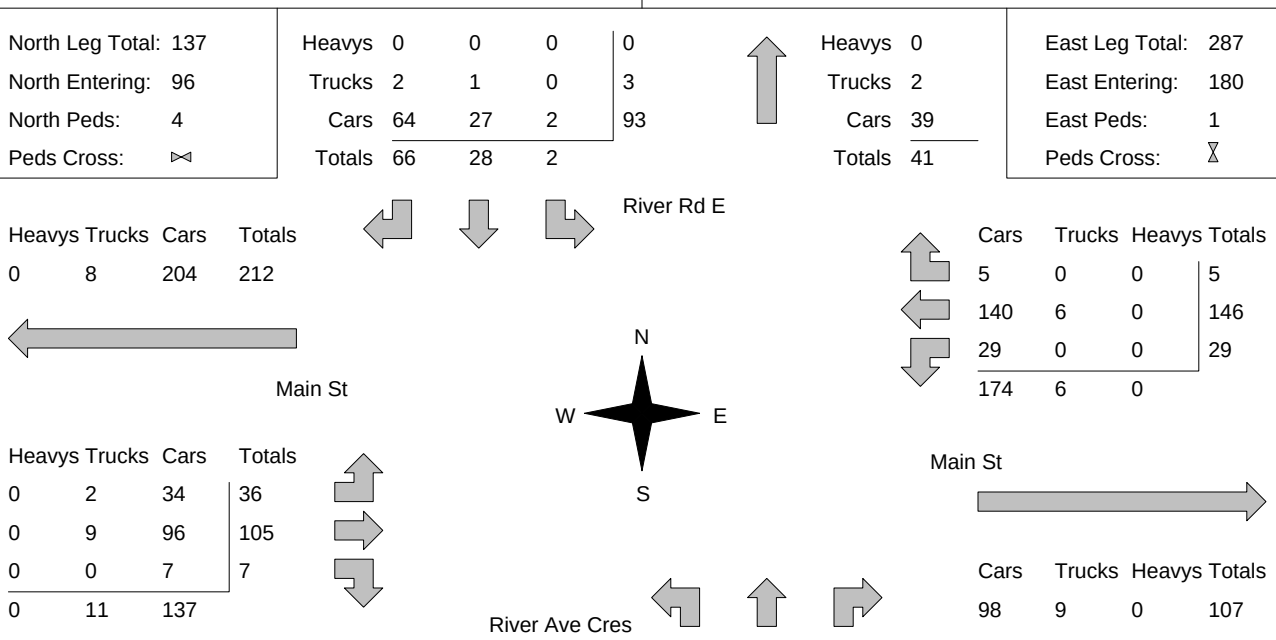
Municipality: Wasaaga Beach
Site #: 1712500015
Intersection: Main St & River Rd E-River Ave Cr
TFR File #: 1
Count date: 29-Jun-17

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Main St runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:30:00
To: 16:30:00

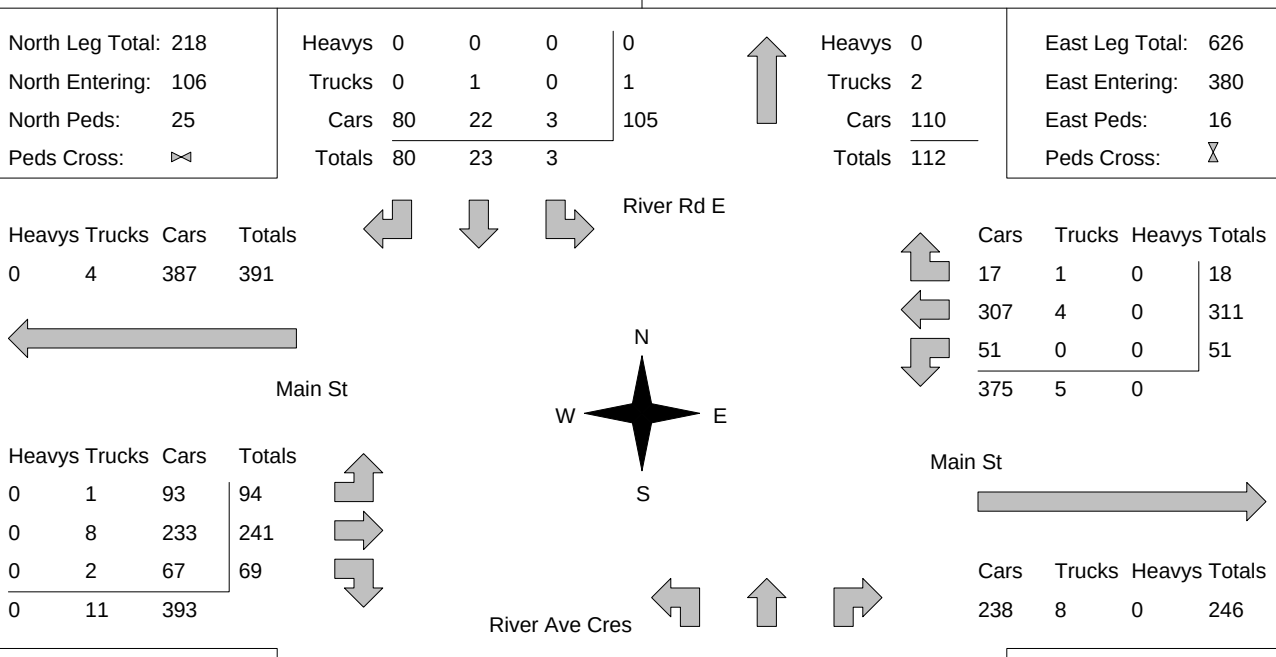
Municipality: Wasaaga Beach
Site #: 1712500015
Intersection: Main St & River Rd E-River Ave Cr
TFR File #: 1
Count date: 29-Jun-17

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Main St runs W/E



Comments

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 9:00:00
To: 10:00:00

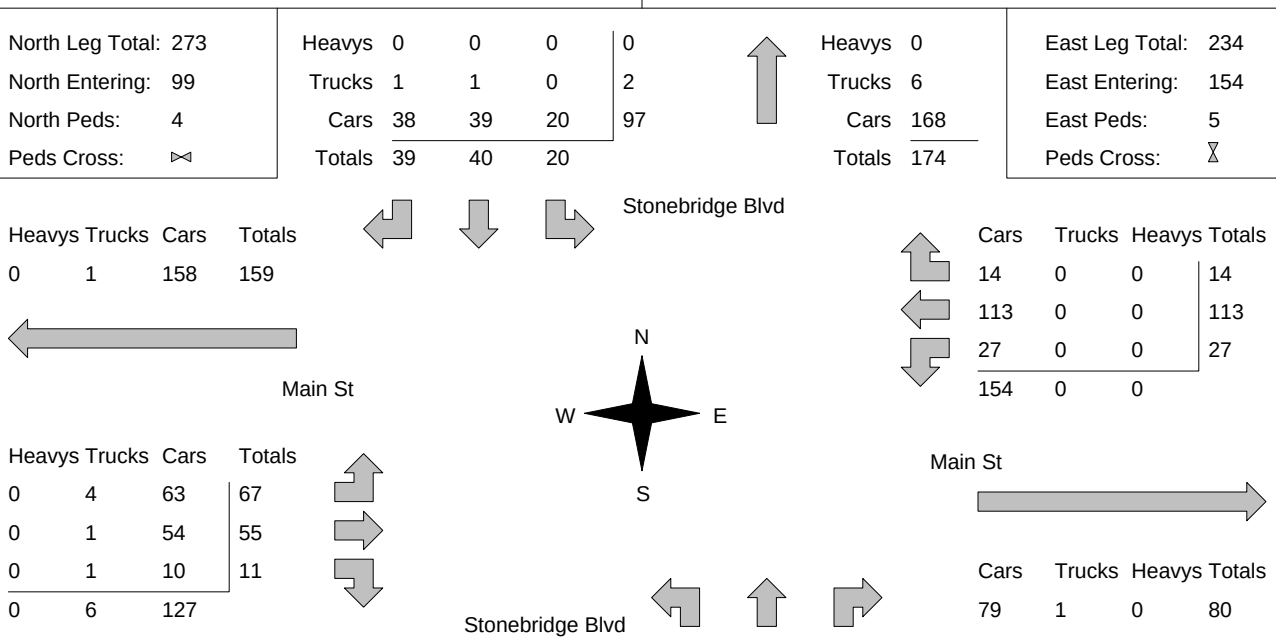
Municipality: Wasaga Beach
Site #: 1712500010
Intersection: Main St & Stonebridge Blvd
TFR File #: 1
Count date: 29-Jun-17

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Main St runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:30:00
To: 16:30:00

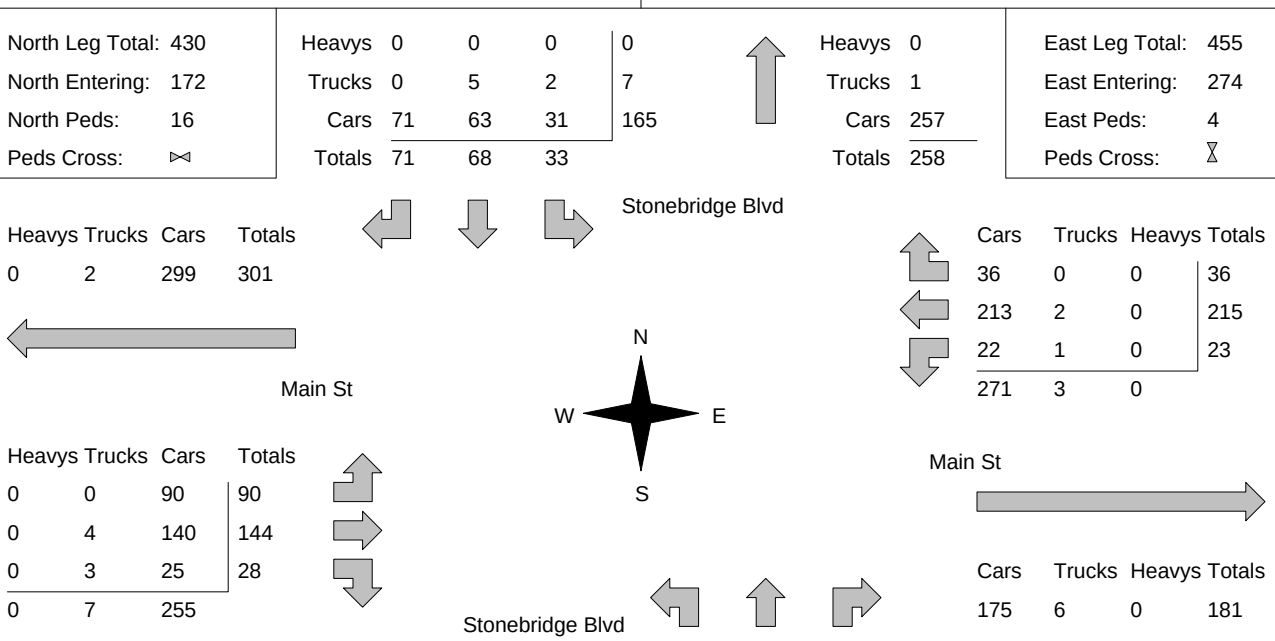
Municipality: Wasaga Beach
Site #: 1712500010
Intersection: Main St & Stonebridge Blvd
TFR File #: 1
Count date: 29-Jun-17

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Main St runs W/E



Comments

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 9:00:00
To: 10:00:00

Municipality: Wasaga Beach
Site #: 1712500016
Intersection: Main St-Mosley St & Jenetta St
TFR File #: 1
Count date: 29-Jun-17

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

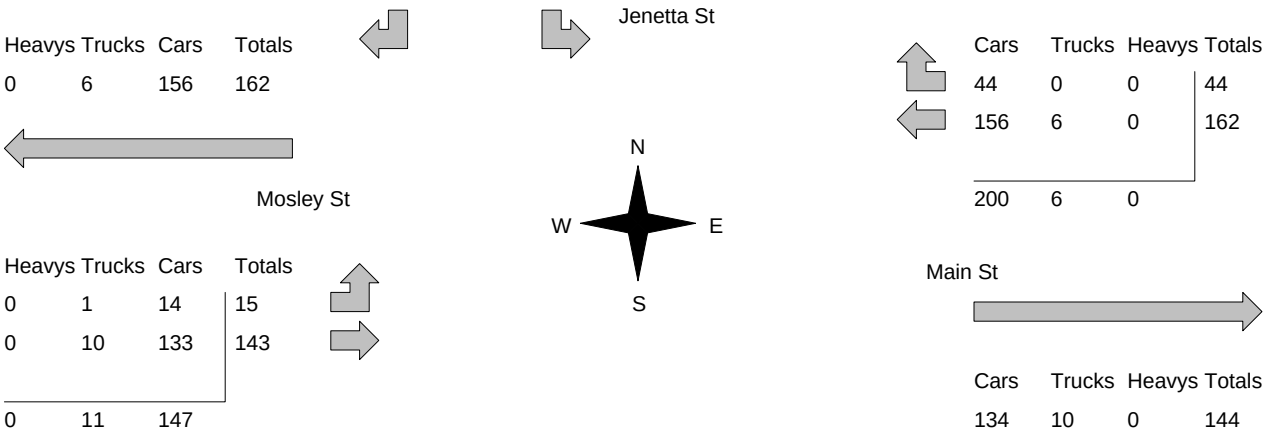
Major Road: Main St-Mosley St runs W/E

North Leg Total: 60
North Entering: 1
North Peds: 5
Peds Cross: ⋈

Heavys	0	0	0
Trucks	0	0	0
Cars	0	1	1
Totals	0	1	

Heavys	0
Trucks	1
Cars	58
Totals	59

East Leg Total: 350
East Entering: 206
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 158
West Leg Total: 320

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:30:00
To: 16:30:00

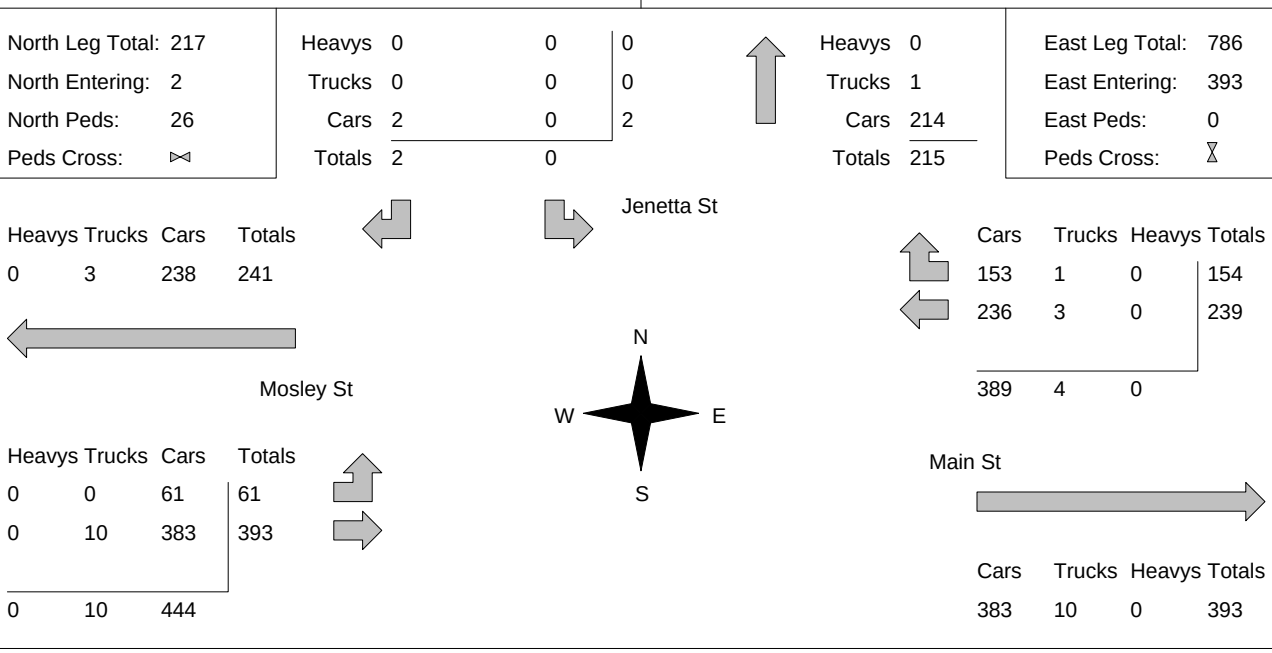
Municipality: Wasaga Beach
Site #: 1712500016
Intersection: Main St-Mosley St & Jenetta St
TFR File #: 1
Count date: 29-Jun-17

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Main St-Mosley St runs W/E



Peds Cross:
West Peds: 20
West Entering: 454
West Leg Total: 695

Comments

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	45	13	0	0	0	0	0	0	0	0	0	0	58
01:00	0	28	17	0	0	0	0	0	0	0	0	0	0	45
02:00	0	23	8	0	0	0	0	0	0	0	0	0	0	31
03:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
04:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
05:00	0	13	7	0	0	0	0	0	0	0	0	0	0	20
06:00	0	30	12	0	1	0	0	0	0	0	0	0	0	43
07:00	3	51	17	0	**8**	0	0	0	0	0	0	0	0	79
08:00	2	115	41	0	5	0	0	3	0	0	2	0	1	169
09:00	4	198	68	0	8	2	0	4	0	0	5	0	2	291
10:00	**7**	339	66	0	6	**4**	0	11	2	0	9	0	4	448
11:00	7	**343**	**87**	0	6	1	**3**	**12**	**7**	**2**	**12**	0	**6**	**486**
12 PM	2	363	**82**	0	**6**	0	**3**	11	8	4	8	0	5	492
13:00	8	347	75	0	2	1	1	**23**	**9**	1	15	2	13	497
14:00	5	382	58	0	1	2	0	12	3	4	10	0	**14**	491
15:00	8	**406**	72	0	3	**7**	2	23	4	2	**23**	**4**	9	**563**
16:00	5	392	66	**1**	4	4	2	14	2	4	16	4	9	523
17:00	**9**	331	71	0	1	1	1	13	2	2	18	0	6	455
18:00	6	349	65	0	1	0	1	16	3	2	14	1	4	462
19:00	8	360	68	0	0	0	1	10	1	**5**	6	0	4	463
20:00	8	364	62	0	1	0	0	12	2	3	8	1	4	465
21:00	2	389	62	0	0	0	0	6	3	0	4	0	1	467
22:00	1	272	51	0	0	0	0	1	7	0	6	0	0	338
23:00	0	209	40	0	0	0	0	0	1	0	1	0	0	251
Day Total	85	5370	1112	1	53	22	14	171	54	29	157	12	82	7162
Percent	1.2%	75.0%	15.5%	0.0%	0.7%	0.3%	0.2%	2.4%	0.8%	0.4%	2.2%	0.2%	1.1%	
AM Peak	10:00	11:00	11:00		07:00	10:00	11:00	11:00	11:00	11:00	11:00		11:00	11:00
Vol.	7	343	87		8	4	3	12	7	2	12		6	486
PM Peak	17:00	15:00	12:00	16:00	12:00	15:00	12:00	13:00	13:00	19:00	15:00	15:00	14:00	15:00
Vol.	9	406	82	1	6	7	3	23	9	5	23	4	14	563

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	0	159	20	0	0	0	0	0	0	0	0	0	0	179
01:00	0	115	25	0	0	0	0	0	0	0	0	0	0	140
02:00	0	99	14	**1**	0	0	0	0	0	0	0	0	0	114
03:00	0	72	6	0	0	0	0	0	0	0	0	0	0	78
04:00	0	32	12	0	0	0	0	0	0	0	0	0	0	44
05:00	0	46	9	0	0	0	0	0	0	0	0	0	0	55
06:00	0	33	14	0	3	2	0	0	0	0	0	0	1	53
07:00	1	79	28	1	10	1	0	0	1	0	3	1	1	126
08:00	3	171	65	0	**12**	**3**	0	4	1	0	7	0	0	266
09:00	7	274	**93**	1	12	3	0	7	3	0	9	0	3	412
10:00	**14**	**360**	84	1	7	2	**3**	**13**	**6**	0	7	**2**	**5**	**504**
11:00	11	354	68	0	4	1	2	11	3	**2**	**11**	0	3	470
12 PM	5	288	60	**1**	2	0	1	18	5	**4**	9	2	10	405
13:00	8	300	72	0	1	1	1	**23**	**7**	0	15	2	10	440
14:00	9	293	51	0	1	**4**	0	10	2	3	14	1	**15**	403
15:00	8	313	77	1	3	2	0	21	7	0	19	**4**	11	466
16:00	9	337	60	0	0	2	**2**	13	6	3	11	2	8	453
17:00	**13**	364	74	0	1	2	1	18	1	3	**20**	1	7	505
18:00	6	385	**79**	0	3	0	2	15	7	0	14	0	3	514
19:00	5	404	73	1	1	0	0	7	0	4	11	0	2	508
20:00	6	423	67	0	**5**	0	1	15	0	1	6	0	1	525
21:00	3	**476**	78	0	0	0	0	7	5	0	3	0	0	**572**
22:00	1	401	73	0	0	0	0	5	1	0	1	0	0	482
23:00	0	319	71	0	0	0	0	1	0	0	0	0	0	391
Day Total	109	6097	1273	7	65	23	13	188	55	20	160	15	80	8105
Percent	1.3%	75.2%	15.7%	0.1%	0.8%	0.3%	0.2%	2.3%	0.7%	0.2%	2.0%	0.2%	1.0%	
AM Peak	10:00	10:00	09:00	02:00	08:00	08:00	10:00	10:00	10:00	11:00	11:00	10:00	10:00	10:00
Vol.	14	360	93	1	12	3	3	13	6	2	11	2	5	504
PM Peak	17:00	21:00	18:00	12:00	20:00	14:00	16:00	13:00	13:00	12:00	17:00	15:00	14:00	21:00
Vol.	13	476	79	1	5	4	2	23	7	4	20	4	15	572

Ontario Traffic, Inc.
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Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	0	247	25	0	0	0	0	0	0	0	0	0	0	272
01:00	0	198	9	0	0	0	0	0	0	0	0	0	0	207
02:00	0	214	8	0	0	0	0	0	0	0	0	0	0	222
03:00	0	134	4	0	0	0	0	0	0	0	0	0	0	138
04:00	0	93	6	0	0	0	0	0	0	0	0	0	0	99
05:00	0	54	6	0	0	0	0	0	0	0	0	0	0	60
06:00	0	53	16	0	7	0	0	1	0	0	0	0	0	77
07:00	0	94	39	0	6	1	0	1	1	0	3	0	0	145
08:00	2	227	75	0	8	0	0	7	0	0	4	0	1	324
09:00	7	300	**95**	1	**11**	0	1	7	2	0	5	0	1	430
10:00	**8**	**376**	79	**3**	6	**3**	**2**	**14**	**4**	0	4	0	**3**	**502**
11:00	5	322	66	0	6	1	1	12	3	0	**10**	**1**	2	429
12 PM	3	253	55	0	0	**2**	0	**20**	2	**4**	9	1	8	357
13:00	6	226	52	0	1	1	0	9	**4**	2	7	**3**	10	321
14:00	7	278	57	**2**	0	0	0	12	4	0	12	1	10	383
15:00	3	333	64	0	**2**	0	1	19	4	1	15	2	**11**	455
16:00	**10**	358	58	0	2	1	**5**	10	2	4	10	1	4	465
17:00	6	350	70	0	0	1	1	13	1	2	14	1	3	462
18:00	7	426	72	0	2	0	0	11	2	0	14	2	1	537
19:00	10	455	**99**	0	2	0	0	10	1	0	**18**	0	4	599
20:00	7	**567**	67	0	0	0	0	9	1	0	5	0	0	**656**
21:00	2	488	66	0	0	0	0	3	3	0	1	0	0	563
22:00	0	370	66	0	0	0	0	1	2	0	2	0	0	441
23:00	0	273	70	0	0	0	0	1	1	0	3	0	0	348
Day Total	83	6689	1224	6	53	10	11	160	37	13	136	12	58	8492
Percent	1.0%	78.8%	14.4%	0.1%	0.6%	0.1%	0.1%	1.9%	0.4%	0.2%	1.6%	0.1%	0.7%	
AM Peak	10:00	10:00	09:00	10:00	09:00	10:00	10:00	10:00	10:00		11:00	11:00	10:00	10:00
Vol.	8	376	95	3	11	3	2	14	4		10	1	3	502
PM Peak	16:00	20:00	19:00	14:00	15:00	12:00	16:00	12:00	13:00	12:00	19:00	13:00	15:00	20:00
Vol.	10	567	99	2	2	2	5	20	4	4	18	3	11	656

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	0	217	27	0	0	0	0	0	0	0	0	0	0	244
01:00	0	50	12	0	0	0	0	0	0	0	0	0	0	62
02:00	0	37	2	0	0	0	0	0	0	0	0	0	0	39
03:00	0	14	5	**1**	0	0	0	0	0	0	0	0	0	20
04:00	0	62	13	0	0	0	0	0	0	0	0	0	0	75
05:00	0	40	18	0	1	0	0	0	0	0	0	0	0	59
06:00	0	43	17	0	10	0	0	0	0	0	0	0	0	70
07:00	1	64	24	0	**12**	0	0	1	1	0	1	1	0	105
08:00	0	126	49	0	12	0	0	3	1	0	6	0	2	199
09:00	6	302	**98**	0	11	1	0	6	0	0	10	0	1	435
10:00	**8**	**406**	75	0	4	**6**	3	**21**	0	1	5	0	1	**530**
11:00	5	361	67	1	4	2	**4**	14	**2**	**2**	**12**	**2**	**10**	486
12 PM	4	295	71	0	2	0	2	15	0	2	14	1	12	418
13:00	7	275	69	0	1	1	1	20	5	3	8	2	10	402
14:00	10	348	60	0	6	1	0	9	**7**	**5**	11	1	**19**	477
15:00	10	344	78	0	**8**	0	0	**23**	7	1	15	2	14	502
16:00	8	406	77	**1**	2	1	**3**	12	7	1	12	3	10	543
17:00	9	430	89	0	2	**3**	1	18	4	1	18	**4**	3	582
18:00	**14**	**501**	84	0	2	2	1	18	3	1	**26**	2	6	**660**
19:00	7	467	**91**	0	4	0	0	6	3	2	14	2	2	598
20:00	9	491	79	0	1	1	1	13	0	2	13	1	2	613
21:00	3	410	62	1	0	0	1	3	0	0	4	0	1	485
22:00	1	171	29	0	0	0	1	1	0	0	2	0	0	205
23:00	0	62	20	0	0	0	0	1	0	0	0	0	0	83
Day Total	102	5922	1216	4	82	18	18	184	40	21	171	21	93	7892
Percent	1.3%	75.0%	15.4%	0.1%	1.0%	0.2%	0.2%	2.3%	0.5%	0.3%	2.2%	0.3%	1.2%	
AM Peak	10:00	10:00	09:00	03:00	07:00	10:00	11:00	10:00	11:00	11:00	11:00	11:00	11:00	10:00
Vol.	8	406	98	1	12	6	4	21	2	2	12	2	10	530
PM Peak	18:00	18:00	19:00	16:00	15:00	17:00	16:00	15:00	14:00	14:00	18:00	17:00	14:00	18:00
Vol.	14	501	91	1	8	3	3	23	7	5	26	4	19	660
Grand Total	379	24078	4825	18	253	73	56	703	186	83	624	60	313	31651
Percent	1.2%	76.1%	15.2%	0.1%	0.8%	0.2%	0.2%	2.2%	0.6%	0.3%	2.0%	0.2%	1.0%	

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	25	2	0	0	0	0	0	0	0	0	0	0	27
01:00	0	17	3	0	0	0	0	0	0	0	0	0	0	20
02:00	0	13	4	0	0	0	0	0	0	0	0	0	0	17
03:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
04:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
05:00	1	11	4	0	0	0	0	0	0	0	0	0	0	16
06:00	0	10	23	0	0	0	0	0	0	0	0	0	0	33
07:00	1	64	22	0	**5**	0	0	0	1	0	0	0	2	95
08:00	0	93	28	0	3	0	0	0	1	0	2	0	0	127
09:00	0	146	39	0	5	0	0	0	0	**3**	3	0	0	196
10:00	0	**172**	**49**	0	5	0	0	1	**3**	1	**20**	**1**	1	**253**
11:00	**4**	152	37	0	5	**1**	**1**	**6**	2	1	14	1	**4**	228
12 PM	2	162	32	0	2	0	**3**	7	**5**	**1**	**17**	**2**	**8**	**241**
13:00	**5**	157	24	0	1	**2**	2	6	4	1	14	2	6	224
14:00	3	140	26	0	**5**	0	2	10	5	1	7	1	2	202
15:00	1	139	23	**1**	1	0	0	9	4	0	13	1	3	195
16:00	2	149	28	0	0	0	0	**16**	2	0	17	1	4	219
17:00	2	137	25	0	0	1	0	11	1	0	16	1	5	199
18:00	2	142	24	1	0	0	0	4	1	0	16	1	1	192
19:00	1	**169**	**43**	1	0	0	2	9	0	1	4	0	0	230
20:00	2	130	23	0	1	1	1	1	2	0	3	0	0	164
21:00	0	133	12	0	2	0	0	1	4	0	4	0	0	156
22:00	0	123	12	0	0	0	0	0	2	0	2	0	0	139
23:00	0	84	10	0	0	0	0	0	0	0	1	0	0	95
Day Total	26	2378	497	3	35	5	11	81	37	9	153	11	36	3282
Percent	0.8%	72.5%	15.1%	0.1%	1.1%	0.2%	0.3%	2.5%	1.1%	0.3%	4.7%	0.3%	1.1%	
AM Peak	11:00	10:00	10:00		07:00	11:00	11:00	11:00	10:00	09:00	10:00	10:00	11:00	10:00
Vol.	4	172	49		5	1	1	6	3	3	20	1	4	253
PM Peak	13:00	19:00	19:00	15:00	14:00	13:00	12:00	16:00	12:00	12:00	12:00	12:00	12:00	12:00
Vol.	5	169	43	1	5	2	3	16	5	1	17	2	8	241

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	0	65	2	**1**	0	0	0	0	0	0	0	0	0	68
01:00	0	69	2	0	0	0	0	0	0	0	0	0	0	71
02:00	0	29	6	0	1	0	1	0	0	0	0	0	0	37
03:00	0	28	3	0	0	0	0	0	0	0	0	0	0	31
04:00	0	14	0	0	0	0	0	0	0	0	0	0	0	14
05:00	0	30	0	0	0	0	0	0	0	0	0	0	0	30
06:00	1	14	5	0	0	0	1	1	0	0	0	0	0	22
07:00	0	39	18	0	1	0	0	2	0	0	0	0	0	60
08:00	1	102	30	1	1	0	0	6	0	**1**	6	0	**3**	151
09:00	1	161	41	0	1	0	0	**10**	0	1	**17**	0	2	234
10:00	**2**	**178**	41	0	**3**	**2**	0	6	0	1	11	0	2	**246**
11:00	0	157	**62**	0	3	2	**2**	3	0	0	15	0	0	244
12 PM	0	**136**	26	0	1	1	1	7	2	1	15	1	**4**	**195**
13:00	**2**	134	26	**1**	1	**2**	1	3	2	1	8	0	4	185
14:00	2	116	26	0	1	0	0	3	0	**2**	6	0	3	159
15:00	0	129	**28**	0	0	1	0	6	0	1	**20**	0	4	189
16:00	2	114	22	0	1	1	0	**11**	0	0	6	0	0	157
17:00	2	129	21	0	0	0	0	1	**6**	0	5	0	0	164
18:00	0	122	22	1	1	1	1	4	0	1	10	0	0	163
19:00	1	110	16	0	1	0	0	1	0	0	7	**2**	3	141
20:00	1	116	18	0	**4**	0	**2**	0	0	0	3	1	1	146
21:00	1	100	16	0	0	0	0	0	0	1	2	1	0	121
22:00	0	90	21	0	0	0	0	1	0	0	0	0	0	112
23:00	0	86	12	0	0	0	0	0	1	0	0	0	0	99
Day Total	16	2268	464	4	20	10	9	65	11	10	131	5	26	3039
Percent	0.5%	74.6%	15.3%	0.1%	0.7%	0.3%	0.3%	2.1%	0.4%	0.3%	4.3%	0.2%	0.9%	
AM Peak	10:00	10:00	11:00	00:00	10:00	10:00	11:00	09:00		08:00	09:00		08:00	10:00
Vol.	2	178	62	1	3	2	2	10		1	17		3	246
PM Peak	13:00	12:00	15:00	13:00	20:00	13:00	20:00	16:00	17:00	14:00	15:00	19:00	12:00	12:00
Vol.	2	136	28	1	4	2	2	11	6	2	20	2	4	195

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
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Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	0	129	11	0	0	0	0	0	0	0	0	0	0	140
01:00	0	82	9	0	0	0	0	0	0	0	0	0	0	91
02:00	0	75	21	0	0	0	0	0	0	0	0	0	0	96
03:00	1	97	2	0	0	0	0	0	0	0	0	0	0	100
04:00	0	33	4	0	1	0	0	0	0	0	0	0	0	38
05:00	1	20	4	0	0	0	0	1	0	0	0	0	1	27
06:00	0	18	22	0	0	0	0	0	0	0	0	0	0	40
07:00	1	60	21	0	1	0	0	0	1	0	0	**1**	0	85
08:00	1	118	38	0	**6**	**1**	0	2	1	1	2	0	1	171
09:00	**3**	**193**	**51**	0	5	0	0	4	0	**4**	6	0	2	**268**
10:00	2	169	49	**1**	6	0	0	**10**	1	2	**14**	0	**4**	258
11:00	1	146	45	0	6	0	**2**	7	**2**	1	13	1	2	226
12 PM	1	**132**	**30**	0	1	**2**	1	7	3	0	**14**	1	4	**196**
13:00	**4**	123	24	0	1	1	1	8	2	**1**	12	**2**	**5**	184
14:00	2	114	24	1	1	1	1	**12**	3	0	9	1	2	171
15:00	1	107	24	0	**2**	1	1	8	**5**	1	12	2	1	165
16:00	1	123	26	0	2	0	0	11	3	0	8	0	2	176
17:00	0	94	17	0	0	1	1	8	4	0	10	0	4	139
18:00	1	86	14	0	1	0	0	4	0	0	6	0	1	113
19:00	2	75	14	**2**	0	0	1	2	0	0	5	0	0	101
20:00	1	69	18	0	1	1	**2**	1	0	0	3	0	0	96
21:00	1	77	14	0	0	1	0	0	1	0	3	0	0	97
22:00	0	83	6	0	0	0	0	1	0	0	4	0	0	94
23:00	0	109	17	0	0	0	0	0	0	0	0	0	0	126
Day Total	24	2332	505	4	34	9	10	86	26	10	121	8	29	3198
Percent	0.8%	72.9%	15.8%	0.1%	1.1%	0.3%	0.3%	2.7%	0.8%	0.3%	3.8%	0.3%	0.9%	
AM Peak	09:00	09:00	09:00	10:00	08:00	08:00	11:00	10:00	11:00	09:00	10:00	07:00	10:00	09:00
Vol.	3	193	51	1	6	1	2	10	2	4	14	1	4	268
PM Peak	13:00	12:00	12:00	19:00	15:00	12:00	20:00	14:00	15:00	13:00	12:00	13:00	13:00	12:00
Vol.	4	132	30	2	2	2	2	12	5	1	14	2	5	196

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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	0	82	16	0	0	0	0	0	0	0	0	0	0	98
01:00	0	34	8	0	0	0	0	0	0	0	0	0	0	42
02:00	0	29	2	0	0	0	0	0	0	0	0	0	0	31
03:00	0	35	2	0	0	0	0	0	0	0	0	0	0	37
04:00	0	33	3	0	0	0	0	0	0	0	0	0	0	36
05:00	0	17	2	0	1	0	1	0	0	**1**	0	0	1	23
06:00	0	23	16	0	0	0	1	0	0	0	0	0	0	40
07:00	1	41	11	0	1	0	0	0	0	0	0	0	0	54
08:00	0	102	31	0	3	0	**2**	0	1	0	1	0	1	141
09:00	2	135	**37**	**1**	**5**	0	0	2	2	0	7	0	**3**	194
10:00	0	**144**	36	0	4	0	0	2	**3**	1	**18**	**1**	2	**211**
11:00	**3**	143	37	0	3	**1**	0	**6**	3	1	12	0	2	211
12 PM	5	126	21	0	0	0	**2**	5	**2**	**1**	**17**	1	**6**	**186**
13:00	3	**133**	22	0	1	**2**	1	2	2	0	12	1	3	182
14:00	2	113	**23**	0	1	1	0	**9**	1	1	11	**2**	2	166
15:00	1	74	17	0	1	0	0	9	2	0	14	1	2	121
16:00	**6**	61	15	0	0	0	0	6	0	1	8	0	1	98
17:00	1	115	20	0	0	1	0	7	2	1	9	2	2	160
18:00	0	86	17	0	0	0	0	2	0	0	8	1	1	115
19:00	3	121	16	0	**2**	0	0	2	0	0	6	0	0	150
20:00	1	73	17	0	0	0	1	1	2	0	3	0	0	98
21:00	1	90	14	0	0	1	0	0	1	0	3	0	1	111
22:00	0	65	7	0	0	0	0	0	0	0	1	0	0	73
23:00	0	31	6	0	0	0	0	0	0	0	0	0	0	37
Day Total	29	1906	396	1	22	6	8	53	21	7	130	9	27	2615
Percent	1.1%	72.9%	15.1%	0.0%	0.8%	0.2%	0.3%	2.0%	0.8%	0.3%	5.0%	0.3%	1.0%	
AM Peak	11:00	10:00	09:00	09:00	09:00	11:00	08:00	11:00	10:00	05:00	10:00	10:00	09:00	10:00
Vol.	3	144	37	1	5	1	2	6	3	1	18	1	3	211
PM Peak	16:00	13:00	14:00		19:00	13:00	12:00	14:00	12:00	12:00	12:00	14:00	12:00	12:00
Vol.	6	133	23		2	2	2	9	2	1	17	2	6	186
Grand Total	95	8884	1862	12	111	30	38	285	95	36	535	33	118	12134
Percent	0.8%	73.2%	15.3%	0.1%	0.9%	0.2%	0.3%	2.3%	0.8%	0.3%	4.4%	0.3%	1.0%	

Ontario Traffic, Inc.
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Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	70	15	0	0	0	0	0	0	0	0	0	0	85
01:00	0	45	20	0	0	0	0	0	0	0	0	0	0	65
02:00	0	36	12	0	0	0	0	0	0	0	0	0	0	48
03:00	0	19	5	0	0	0	0	0	0	0	0	0	0	24
04:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
05:00	1	24	11	0	0	0	0	0	0	0	0	0	0	36
06:00	0	40	35	0	1	0	0	0	0	0	0	0	0	76
07:00	4	115	39	0	**13**	0	0	0	1	0	0	0	2	174
08:00	2	208	69	0	8	0	0	3	1	0	4	0	1	296
09:00	4	344	107	0	13	2	0	4	0	**3**	8	0	2	487
10:00	7	**511**	115	0	11	**4**	0	12	5	1	**29**	**1**	5	701
11:00	**11**	495	**124**	0	11	2	**4**	**18**	**9**	3	26	1	**10**	**714**
12 PM	4	525	**114**	0	**8**	0	**6**	18	**13**	5	25	2	13	733
13:00	**13**	504	99	0	3	3	3	29	13	2	29	4	**19**	721
14:00	8	522	84	0	6	2	2	22	8	5	17	1	16	693
15:00	9	**545**	95	**1**	4	**7**	2	**32**	8	2	**36**	**5**	12	**758**
16:00	7	541	94	1	4	4	2	30	4	4	33	5	13	742
17:00	11	468	96	0	1	2	1	24	3	2	34	1	11	654
18:00	8	491	89	1	1	0	1	20	4	2	30	2	5	654
19:00	9	529	111	1	0	0	3	19	1	**6**	10	0	4	693
20:00	10	494	85	0	2	1	1	13	4	3	11	1	4	629
21:00	2	522	74	0	2	0	0	7	7	0	8	0	1	623
22:00	1	395	63	0	0	0	0	1	9	0	8	0	0	477
23:00	0	293	50	0	0	0	0	0	1	0	2	0	0	346
Day Total	111	7748	1609	4	88	27	25	252	91	38	310	23	118	10444
Percent	1.1%	74.2%	15.4%	0.0%	0.8%	0.3%	0.2%	2.4%	0.9%	0.4%	3.0%	0.2%	1.1%	
AM Peak	11:00	10:00	11:00		07:00	10:00	11:00	11:00	11:00	09:00	10:00	10:00	11:00	11:00
Vol.	11	511	124		13	4	4	18	9	3	29	1	10	714
PM Peak	13:00	15:00	12:00	15:00	12:00	15:00	12:00	15:00	12:00	19:00	15:00	15:00	13:00	15:00
Vol.	13	545	114	1	8	7	6	32	13	6	36	5	19	758

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	0	224	22	**1**	0	0	0	0	0	0	0	0	0	247
01:00	0	184	27	0	0	0	0	0	0	0	0	0	0	211
02:00	0	128	20	1	1	0	1	0	0	0	0	0	0	151
03:00	0	100	9	0	0	0	0	0	0	0	0	0	0	109
04:00	0	46	12	0	0	0	0	0	0	0	0	0	0	58
05:00	0	76	9	0	0	0	0	0	0	0	0	0	0	85
06:00	1	47	19	0	3	2	1	1	0	0	0	0	1	75
07:00	1	118	46	1	11	1	0	2	1	0	3	1	1	186
08:00	4	273	95	1	**13**	3	0	10	1	1	13	0	3	417
09:00	8	435	**134**	1	13	3	0	17	3	1	**26**	0	5	646
10:00	**16**	**538**	125	1	10	**4**	3	**19**	**6**	1	18	**2**	**7**	**750**
11:00	11	511	130	0	7	3	**4**	14	3	**2**	26	0	3	714
12 PM	5	424	86	**1**	3	1	2	25	7	**5**	24	3	14	600
13:00	10	434	98	1	2	3	2	26	**9**	1	23	2	14	625
14:00	11	409	77	0	2	**4**	0	13	2	5	20	1	**18**	562
15:00	8	442	**105**	1	3	3	0	**27**	7	1	**39**	**4**	15	655
16:00	11	451	82	0	1	3	2	24	6	3	17	2	8	610
17:00	**15**	493	95	0	1	2	1	19	7	3	25	1	7	669
18:00	6	507	101	1	4	1	**3**	19	7	1	24	0	3	677
19:00	6	514	89	1	2	0	0	8	0	4	18	2	5	649
20:00	7	539	85	0	**9**	0	3	15	0	1	9	1	2	671
21:00	4	**576**	94	0	0	0	0	7	5	1	5	1	0	**693**
22:00	1	491	94	0	0	0	0	6	1	0	1	0	0	594
23:00	0	405	83	0	0	0	0	1	1	0	0	0	0	490
Day Total	125	8365	1737	11	85	33	22	253	66	30	291	20	106	11144
Percent	1.1%	75.1%	15.6%	0.1%	0.8%	0.3%	0.2%	2.3%	0.6%	0.3%	2.6%	0.2%	1.0%	
AM Peak	10:00	10:00	09:00	00:00	08:00	10:00	11:00	10:00	10:00	11:00	09:00	10:00	10:00	10:00
Vol.	16	538	134	1	13	4	4	19	6	2	26	2	7	750
PM Peak	17:00	21:00	15:00	12:00	20:00	14:00	18:00	15:00	13:00	12:00	15:00	15:00	14:00	21:00
Vol.	15	576	105	1	9	4	3	27	9	5	39	4	18	693

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	0	376	36	0	0	0	0	0	0	0	0	0	0	412
01:00	0	280	18	0	0	0	0	0	0	0	0	0	0	298
02:00	0	289	29	0	0	0	0	0	0	0	0	0	0	318
03:00	1	231	6	0	0	0	0	0	0	0	0	0	0	238
04:00	0	126	10	0	1	0	0	0	0	0	0	0	0	137
05:00	1	74	10	0	0	0	0	1	0	0	0	0	1	87
06:00	0	71	38	0	7	0	0	1	0	0	0	0	0	117
07:00	1	154	60	0	7	1	0	1	2	0	3	1	0	230
08:00	3	345	113	0	14	1	0	9	1	1	6	0	2	495
09:00	**10**	493	**146**	1	**16**	0	1	11	2	**4**	11	0	3	698
10:00	10	**545**	128	**4**	12	**3**	2	**24**	**5**	2	18	0	**7**	**760**
11:00	6	468	111	0	12	1	**3**	19	5	1	**23**	**2**	4	655
12 PM	4	385	85	0	1	**4**	1	**27**	5	**4**	23	2	12	553
13:00	10	349	76	0	2	2	1	17	6	3	19	**5**	**15**	505
14:00	9	392	81	**3**	1	1	1	24	7	0	21	2	12	554
15:00	4	440	88	0	**4**	1	2	27	**9**	2	**27**	4	12	620
16:00	11	481	84	0	4	1	**5**	21	5	4	18	1	6	641
17:00	6	444	87	0	0	2	2	21	5	2	24	1	7	601
18:00	8	512	86	0	3	0	0	15	2	0	20	2	2	650
19:00	**12**	530	**113**	2	2	0	1	12	1	0	23	0	4	700
20:00	8	**636**	85	0	1	1	2	10	1	0	8	0	0	**752**
21:00	3	565	80	0	0	1	0	3	4	0	4	0	0	660
22:00	0	453	72	0	0	0	0	2	2	0	6	0	0	535
23:00	0	382	87	0	0	0	0	1	1	0	3	0	0	474
Day Total	107	9021	1729	10	87	19	21	246	63	23	257	20	87	11690
Percent	0.9%	77.2%	14.8%	0.1%	0.7%	0.2%	0.2%	2.1%	0.5%	0.2%	2.2%	0.2%	0.7%	
AM Peak	09:00	10:00	09:00	10:00	09:00	10:00	11:00	10:00	10:00	09:00	11:00	11:00	10:00	10:00
Vol.	10	545	146	4	16	3	3	24	5	4	23	2	7	760
PM Peak	19:00	20:00	19:00	14:00	15:00	12:00	16:00	12:00	15:00	12:00	15:00	13:00	13:00	20:00
Vol.	12	636	113	3	4	4	5	27	9	4	27	5	15	752

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	0	299	43	0	0	0	0	0	0	0	0	0	0	342
01:00	0	84	20	0	0	0	0	0	0	0	0	0	0	104
02:00	0	66	4	0	0	0	0	0	0	0	0	0	0	70
03:00	0	49	7	**1**	0	0	0	0	0	0	0	0	0	57
04:00	0	95	16	0	0	0	0	0	0	0	0	0	0	111
05:00	0	57	20	0	2	0	1	0	0	1	0	0	1	82
06:00	0	66	33	0	10	0	1	0	0	0	0	0	0	110
07:00	2	105	35	0	13	0	0	1	1	0	1	1	0	159
08:00	0	228	80	0	15	0	2	3	2	0	7	0	3	340
09:00	**8**	437	**135**	1	**16**	1	0	8	2	0	17	0	4	629
10:00	8	**550**	111	0	8	**6**	3	**23**	3	2	23	1	3	**741**
11:00	8	504	104	1	7	3	**4**	20	**5**	**3**	**24**	**2**	**12**	697
12 PM	9	421	92	0	2	0	**4**	20	2	3	31	2	18	604
13:00	10	408	91	0	2	3	2	22	7	3	20	3	13	584
14:00	12	461	83	0	7	2	0	18	8	**6**	22	3	**21**	643
15:00	11	418	95	0	**9**	0	0	**32**	**9**	1	29	3	16	623
16:00	**14**	467	92	**1**	2	1	3	18	7	2	20	3	11	641
17:00	10	545	**109**	0	2	**4**	1	25	6	2	27	**6**	5	742
18:00	14	587	101	0	2	2	1	20	3	1	**34**	3	7	**775**
19:00	10	**588**	107	0	6	0	0	8	3	2	20	2	2	748
20:00	10	564	96	0	1	1	2	14	2	2	16	1	2	711
21:00	4	500	76	1	0	1	1	3	1	0	7	0	2	596
22:00	1	236	36	0	0	0	1	1	0	0	3	0	0	278
23:00	0	93	26	0	0	0	0	1	0	0	0	0	0	120
Day Total	131	7828	1612	5	104	24	26	237	61	28	301	30	120	10507
Percent	1.2%	74.5%	15.3%	0.0%	1.0%	0.2%	0.2%	2.3%	0.6%	0.3%	2.9%	0.3%	1.1%	
AM Peak	09:00	10:00	09:00	03:00	09:00	10:00	11:00	10:00	11:00	11:00	11:00	11:00	11:00	10:00
Vol.	8	550	135	1	16	6	4	23	5	3	24	2	12	741
PM Peak	16:00	19:00	17:00	16:00	15:00	17:00	12:00	15:00	15:00	14:00	18:00	17:00	14:00	18:00
Vol.	14	588	109	1	9	4	4	32	9	6	34	6	21	775
Grand Total	474	32962	6687	30	364	103	94	988	281	119	1159	93	431	43785
Percent	1.1%	75.3%	15.3%	0.1%	0.8%	0.2%	0.2%	2.3%	0.6%	0.3%	2.6%	0.2%	1.0%	

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
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Date Start: 30-Jun-17

EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	0	8	13	27	7	**3**	0	0	0	0	0	0	58	50	56
01:00	**1**	0	0	11	33	0	0	0	0	0	0	0	0	45	47	49
02:00	0	0	0	10	11	**10**	0	0	0	0	0	0	0	31	54	57
03:00	0	0	0	3	5	6	0	0	0	0	0	0	0	14	53	54
04:00	0	0	0	7	2	2	0	0	0	0	0	0	0	11	49	50
05:00	0	0	0	9	10	1	0	0	0	0	0	0	0	20	47	49
06:00	0	0	1	13	25	3	1	0	0	0	0	0	0	43	48	51
07:00	0	0	4	32	39	4	0	0	0	0	0	0	0	79	47	49
08:00	0	1	8	75	79	6	0	0	0	0	0	0	0	169	47	49
09:00	0	0	35	166	86	4	0	**1**	0	0	0	0	0	292	45	48
10:00	1	**3**	67	263	**113**	0	0	0	0	0	0	0	0	447	43	47
11:00	0	3	**138**	**281**	63	0	1	0	0	0	0	0	0	**486**	39	46
12 PM	0	15	**208**	235	33	0	1	0	0	0	0	0	0	492	38	42
13:00	**1**	**22**	181	244	49	0	0	0	0	0	0	0	0	497	38	44
14:00	0	14	179	250	48	0	0	0	0	0	0	0	0	491	38	44
15:00	1	7	187	**293**	72	3	0	0	0	0	0	0	0	**563**	39	46
16:00	1	6	148	273	90	5	0	0	0	0	0	0	0	523	41	47
17:00	0	2	112	252	88	1	0	0	0	0	0	0	0	455	42	47
18:00	0	1	98	255	106	1	1	0	0	0	0	0	0	462	43	47
19:00	0	7	129	243	83	1	0	0	0	0	0	0	0	463	41	47
20:00	0	3	68	293	100	1	0	0	0	0	0	0	0	465	43	47
21:00	0	5	56	226	**163**	**16**	1	0	0	0	0	0	0	467	46	49
22:00	0	0	29	170	132	7	0	0	0	0	0	0	0	338	46	49
23:00	0	3	8	120	112	6	**2**	0	0	0	0	0	0	251	47	49
Total	5	92	1664	3737	1569	84	10	1	0	0	0	0	0	7162		
Percent	0.1%	1.3%	23.2%	52.2%	21.9%	1.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	01:00	10:00	11:00	11:00	10:00	02:00	00:00	09:00						11:00		
Vol.	1	3	138	281	113	10	3	1						486		
PM Peak	13:00	13:00	12:00	15:00	21:00	21:00	23:00							15:00		
Vol.	1	22	208	293	163	16	2							563		

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Mosley St between 1st St & Willow St

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EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/01/17	0	0	4	48	118	9	0	0	0	0	0	0	0	179	48	49
01:00	**1**	0	3	30	103	3	0	0	0	0	0	0	0	140	48	49
02:00	0	0	8	60	35	11	0	0	0	0	0	0	0	114	47	53
03:00	0	0	0	1	16	**61**	0	0	0	0	0	0	0	78	57	59
04:00	0	0	0	18	8	18	0	0	0	0	0	0	0	44	55	57
05:00	0	0	0	26	23	6	0	0	0	0	0	0	0	55	48	52
06:00	0	0	2	14	31	6	0	0	0	0	0	0	0	53	49	52
07:00	0	1	6	50	58	11	0	0	0	0	0	0	0	126	48	53
08:00	0	1	16	143	100	4	0	**1**	**1**	0	0	0	0	266	46	49
09:00	1	4	50	232	**120**	2	**2**	0	0	**1**	0	0	0	412	45	48
10:00	0	**10**	85	**287**	112	8	1	1	0	0	0	0	0	**504**	43	48
11:00	0	10	**110**	258	83	7	1	1	0	0	0	0	0	470	42	48
12 PM	0	15	141	216	30	2	1	0	0	0	0	0	0	405	38	44
13:00	**1**	**19**	**157**	222	40	1	0	0	0	0	0	0	0	440	38	44
14:00	0	13	127	205	53	4	0	**1**	0	0	0	0	0	403	39	46
15:00	1	9	152	240	56	6	1	1	0	0	0	0	0	466	39	46
16:00	1	9	156	229	53	4	1	0	0	0	0	0	0	453	39	46
17:00	0	4	107	282	109	2	1	0	0	0	0	0	0	505	43	47
18:00	0	7	120	287	91	8	1	0	0	0	0	0	0	514	42	48
19:00	0	8	104	291	101	3	1	0	0	0	0	0	0	508	42	47
20:00	0	3	70	**302**	138	12	0	0	0	0	0	0	0	525	45	48
21:00	1	5	57	277	210	21	1	0	0	0	0	0	0	**572**	46	49
22:00	0	1	55	179	**221**	24	**2**	0	0	0	0	0	0	482	47	50
23:00	0	5	12	153	194	**25**	1	1	0	0	0	0	0	391	48	52
Total	6	124	1542	4050	2103	258	14	6	1	1	0	0	0	8105		
Percent	0.1%	1.5%	19.0%	50.0%	25.9%	3.2%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	01:00	10:00	11:00	10:00	09:00	03:00	09:00	08:00	08:00	09:00				10:00		
Vol.	1	10	110	287	120	61	2	1	1	1				504		
PM Peak	13:00	13:00	13:00	20:00	22:00	23:00	22:00	14:00						21:00		
Vol.	1	19	157	302	221	25	2	1						572		

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
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Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/02/17	0	0	4	145	113	7	3	0	0	0	0	0	0	272	47	49
01:00	0	1	5	67	105	18	**8**	**2**	**1**	0	0	0	0	207	49	60
02:00	0	0	0	51	**138**	33	0	0	0	0	0	0	0	222	49	56
03:00	0	0	1	5	114	18	0	0	0	0	0	0	0	138	49	55
04:00	0	0	1	18	21	**59**	0	0	0	0	0	0	0	99	57	58
05:00	0	0	0	26	6	28	0	0	0	0	0	0	0	60	56	58
06:00	0	0	0	20	41	15	1	0	0	0	0	0	0	77	51	56
07:00	0	3	11	65	57	9	0	0	0	0	0	0	0	145	47	51
08:00	0	0	40	135	137	12	0	0	0	0	0	0	0	324	47	49
09:00	**1**	2	55	244	126	2	0	0	0	0	0	0	0	430	44	48
10:00	0	4	74	**293**	123	7	1	0	0	0	0	0	0	**502**	44	48
11:00	0	**10**	**82**	246	82	7	1	1	0	0	0	0	0	429	43	48
12 PM	0	6	115	195	39	2	0	0	0	0	0	0	0	357	39	45
13:00	0	3	118	160	40	0	0	0	0	0	0	0	0	321	39	45
14:00	1	1	117	216	47	0	1	0	0	0	0	0	0	383	39	45
15:00	0	3	**154**	256	42	0	0	0	0	0	0	0	0	455	38	44
16:00	0	1	72	293	99	0	0	0	0	0	0	0	0	465	42	47
17:00	0	4	56	287	110	3	2	0	0	0	0	0	0	462	44	48
18:00	0	0	110	297	123	7	0	0	0	0	0	0	0	537	43	48
19:00	**2**	1	128	339	122	5	2	0	0	0	0	0	0	599	43	48
20:00	0	5	103	**366**	176	3	3	0	0	0	0	0	0	**656**	44	48
21:00	0	**10**	76	304	164	6	3	0	0	0	0	0	0	563	45	48
22:00	0	2	41	157	**236**	5	0	0	0	0	0	0	0	441	47	49
23:00	0	6	3	97	195	**43**	**4**	0	0	0	0	0	0	348	49	56
Total	4	62	1366	4282	2456	289	29	3	1	0	0	0	0	8492		
Percent	0.0%	0.7%	16.1%	50.4%	28.9%	3.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	11:00	11:00	10:00	02:00	04:00	01:00	01:00	01:00					10:00		
Vol.	1	10	82	293	138	59	8	2	1					502		
PM Peak	19:00	21:00	15:00	20:00	22:00	23:00	23:00							20:00		
Vol.	2	10	154	366	236	43	4							656		

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	**1**	1	39	122	53	**21**	**7**	0	0	0	0	0	0	244	48	57
01:00	0	0	0	20	37	4	1	0	0	0	0	0	0	62	48	51
02:00	0	0	0	18	18	2	1	0	0	0	0	0	0	39	47	50
03:00	0	0	0	9	5	6	0	0	0	0	0	0	0	20	52	54
04:00	0	1	2	33	36	3	0	0	0	0	0	0	0	75	47	49
05:00	0	0	1	30	23	5	0	0	0	0	0	0	0	59	47	51
06:00	0	0	0	23	35	12	0	0	0	0	0	0	0	70	50	55
07:00	0	1	8	44	45	6	1	0	0	0	0	0	0	105	47	51
08:00	1	1	18	105	68	6	0	0	0	0	0	0	0	199	46	49
09:00	1	**9**	51	241	123	9	0	**1**	0	0	0	0	0	435	45	48
10:00	0	8	73	**289**	**144**	14	2	0	0	0	0	0	0	**530**	45	49
11:00	1	8	**86**	287	93	8	2	1	0	0	0	0	0	486	43	48
12 PM	**1**	8	122	247	36	3	1	0	0	0	0	0	0	418	39	44
13:00	0	10	**162**	188	38	2	1	1	0	0	0	0	0	402	38	45
14:00	1	3	112	276	74	6	**4**	1	0	0	0	0	0	477	41	48
15:00	0	6	145	282	66	2	1	0	0	0	0	0	0	502	39	46
16:00	1	**11**	123	299	94	12	2	1	0	0	0	0	0	543	42	48
17:00	0	11	111	327	117	11	4	1	0	0	0	0	0	582	43	48
18:00	0	5	127	**379**	127	**20**	1	1	0	0	0	0	0	**660**	43	49
19:00	0	5	140	320	119	9	1	**3**	**1**	0	0	0	0	598	43	48
20:00	1	3	65	357	**172**	14	1	0	0	0	0	0	0	613	45	49
21:00	0	5	80	242	141	15	2	0	0	0	0	0	0	485	45	49
22:00	0	4	24	76	94	7	0	0	0	0	0	0	0	205	47	49
23:00	0	0	8	30	40	4	1	0	0	0	0	0	0	83	48	50
Total	8	100	1497	4244	1798	201	33	10	1	0	0	0	0	7892		
Percent	0.1%	1.3%	19.0%	53.8%	22.8%	2.5%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	00:00	09:00	11:00	10:00	10:00	00:00	00:00	09:00						10:00		
Vol.	1	9	86	289	144	21	7	1						530		
PM Peak	12:00	16:00	13:00	18:00	20:00	18:00	14:00	19:00	19:00					18:00		
Vol.	1	11	162	379	172	20	4	3	1					660		
Grand Total	23	378	6069	16313	7926	832	86	20	3	1	0	0	0	31651		
Percent	0.1%	1.2%	19.2%	51.5%	25.0%	2.6%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	27 KPH
	50th Percentile :	35 KPH
	85th Percentile :	45 KPH
	95th Percentile :	49 KPH
Stats	10 KPH Pace Speed :	30-39 KPH
	Number in Pace :	16313
	Percent in Pace :	51.5%
	Number of Vehicles > 40 KPH :	8075
	Percent of Vehicles > 40 KPH :	25.5%
	Mean Speed(Average) :	35 KPH

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
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WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	0	1	9	17	0	0	0	0	0	0	0	0	27	46	48
01:00	0	0	4	2	9	4	**1**	0	0	0	0	0	0	20	51	53
02:00	0	**1**	0	2	10	2	1	**1**	0	0	0	0	0	17	50	69
03:00	0	0	1	2	1	5	1	0	0	0	0	0	0	10	53	54
04:00	0	0	0	0	3	1	0	0	0	0	0	0	0	4	42	50
05:00	0	1	1	0	13	0	1	0	0	0	0	0	0	16	48	49
06:00	0	0	1	2	21	9	0	0	0	0	0	0	0	33	53	56
07:00	0	0	1	15	59	**19**	1	0	0	0	0	0	0	95	52	57
08:00	0	0	3	32	76	16	0	0	0	0	0	0	0	127	49	54
09:00	0	0	3	43	**134**	15	1	0	0	0	0	0	0	196	48	52
10:00	0	0	**15**	**107**	119	10	1	0	**1**	0	0	0	0	**253**	47	49
11:00	0	0	13	101	103	11	0	0	0	0	0	0	0	228	47	49
12 PM	**1**	1	12	128	99	0	0	0	0	0	0	0	0	**241**	46	48
13:00	0	1	17	**131**	70	3	**2**	0	0	0	0	0	0	224	45	49
14:00	0	2	16	94	84	4	1	0	0	**1**	0	0	0	202	46	49
15:00	0	0	12	88	91	2	1	**1**	0	0	0	0	0	195	47	49
16:00	0	0	11	87	**111**	9	1	0	0	0	0	0	0	219	47	49
17:00	0	2	17	73	90	16	0	1	0	0	0	0	0	199	48	53
18:00	0	1	3	59	109	**19**	1	0	0	0	0	0	0	192	49	54
19:00	0	1	**22**	85	110	12	0	0	0	0	0	0	0	230	47	49
20:00	0	**3**	14	50	82	14	1	0	0	0	0	0	0	164	48	53
21:00	0	0	13	45	93	4	1	0	0	0	0	0	0	156	47	49
22:00	0	0	12	50	71	4	2	0	0	0	0	0	0	139	47	49
23:00	0	0	2	47	42	4	0	0	0	0	0	0	0	95	47	49
Total	1	13	194	1252	1617	183	17	3	1	1	0	0	0	3282		
Percent	0.0%	0.4%	5.9%	38.1%	49.3%	5.6%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		02:00	10:00	10:00	09:00	07:00	01:00	02:00	10:00					10:00		
Vol.		1	15	107	134	19	1	1	1					253		
PM Peak	12:00	20:00	19:00	13:00	16:00	18:00	13:00	15:00		14:00				12:00		
Vol.	1	3	22	131	111	19	2	1		1				241		

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Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
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WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/01/17	0	**1**	9	13	40	4	0	1	0	0	0	0	0	68	48	51
01:00	0	1	3	26	31	9	1	0	0	0	0	0	0	71	49	55
02:00	**1**	1	1	16	15	1	0	**2**	0	0	0	0	0	37	46	50
03:00	0	1	0	14	14	1	1	0	0	0	0	0	0	31	46	49
04:00	0	0	1	6	6	0	1	0	0	0	0	0	0	14	44	45
05:00	0	0	0	1	28	1	0	0	0	0	0	0	0	30	47	49
06:00	0	0	0	1	16	5	0	0	0	0	0	0	0	22	51	53
07:00	0	0	1	10	36	12	1	0	0	0	0	0	0	60	51	57
08:00	0	0	1	38	90	**21**	0	0	0	**1**	0	0	0	151	49	56
09:00	0	0	6	71	**138**	16	2	0	**1**	0	0	0	0	234	48	53
10:00	0	0	**17**	105	108	14	1	1	0	0	0	0	0	**246**	47	51
11:00	0	0	4	**123**	110	4	**3**	0	0	0	0	0	0	244	47	49
12 PM	0	0	13	98	82	2	0	0	0	0	0	0	0	**195**	46	48
13:00	**1**	3	**15**	**99**	64	2	1	0	0	0	0	0	0	185	45	48
14:00	0	**4**	7	83	60	4	1	0	0	0	0	0	0	159	46	49
15:00	1	0	10	89	81	7	0	**1**	0	0	0	0	0	189	47	49
16:00	0	0	8	60	80	9	0	0	0	0	0	0	0	157	48	50
17:00	1	2	9	61	80	11	0	0	0	0	0	0	0	164	48	51
18:00	0	0	10	48	**92**	**12**	1	0	0	0	0	0	0	163	48	52
19:00	0	3	10	47	71	10	0	0	0	0	0	0	0	141	48	52
20:00	0	1	15	50	70	10	0	0	0	0	0	0	0	146	48	52
21:00	0	0	6	40	66	8	0	1	0	0	0	0	0	121	48	52
22:00	0	0	4	45	54	6	**3**	0	0	0	0	0	0	112	48	52
23:00	0	0	5	36	46	12	0	0	0	0	0	0	0	99	49	54
Total	4	17	155	1180	1478	181	16	6	1	1	0	0	0	3039		
Percent	0.1%	0.6%	5.1%	38.8%	48.6%	6.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	02:00	00:00	10:00	11:00	09:00	08:00	11:00	02:00	09:00	08:00				10:00		
Vol.	1	1	17	123	138	21	3	2	1	1				246		
PM Peak	13:00	14:00	13:00	13:00	18:00	18:00	22:00	15:00						12:00		
Vol.	1	4	15	99	92	12	3	1						195		

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WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/02/17	**1**	**3**	**20**	26	79	9	1	**1**	0	0	0	0	0	140	48	53
01:00	0	1	2	24	47	12	**4**	1	0	0	0	0	0	91	51	59
02:00	1	2	5	33	35	17	1	1	**1**	0	0	0	0	96	52	57
03:00	1	1	9	19	24	**42**	4	0	0	0	0	0	0	100	57	59
04:00	0	0	2	4	29	0	2	1	0	0	0	0	0	38	48	60
05:00	0	0	2	3	19	2	1	0	0	0	0	0	0	27	48	51
06:00	0	0	1	4	25	10	0	0	0	0	0	0	0	40	53	57
07:00	0	0	3	12	51	18	1	0	0	0	0	0	0	85	52	57
08:00	0	1	5	40	96	27	2	0	0	0	0	0	0	171	50	56
09:00	0	0	9	73	**168**	18	0	0	0	0	0	0	0	**268**	48	52
10:00	0	0	20	100	118	17	1	1	1	0	0	0	0	258	48	53
11:00	0	0	14	**106**	97	7	2	0	0	0	0	0	0	226	47	49
12 PM	0	1	12	**104**	77	2	0	0	0	0	0	0	0	**196**	46	48
13:00	**1**	0	**18**	101	62	1	0	0	**1**	0	0	0	0	184	45	48
14:00	0	1	14	83	69	3	0	**1**	0	0	0	0	0	171	46	49
15:00	0	**2**	5	83	68	6	1	0	0	0	0	0	0	165	47	49
16:00	0	1	7	72	**87**	9	0	0	0	0	0	0	0	176	47	49
17:00	0	1	10	53	68	6	0	1	0	0	0	0	0	139	47	49
18:00	0	0	7	34	60	**11**	0	1	0	0	0	0	0	113	49	54
19:00	0	0	6	47	46	2	0	0	0	0	0	0	0	101	46	49
20:00	0	2	12	39	35	7	1	0	0	0	0	0	0	96	47	52
21:00	0	0	5	31	52	7	**2**	0	0	0	0	0	0	97	48	53
22:00	0	0	2	36	48	6	1	1	0	0	0	0	0	94	48	52
23:00	0	0	4	58	58	6	0	0	0	0	0	0	0	126	47	49
Total	4	16	194	1185	1518	245	24	9	3	0	0	0	0	3198		
Percent	0.1%	0.5%	6.1%	37.1%	47.5%	7.7%	0.8%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	00:00	00:00	00:00	11:00	09:00	03:00	01:00	00:00	02:00					09:00		
Vol.	1	3	20	106	168	42	4	1	1					268		
PM Peak	13:00	15:00	13:00	12:00	16:00	18:00	21:00	14:00	13:00					12:00		
Vol.	1	2	18	104	87	11	2	1	1					196		

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WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	**1**	**2**	13	28	31	13	**5**	**3**	**1**	0	**1**	0	0	98	54	64
01:00	0	0	2	19	15	2	0	3	1	0	0	0	0	42	49	71
02:00	0	0	1	5	20	3	0	1	1	0	0	0	0	31	49	52
03:00	0	1	2	5	16	11	0	2	0	0	0	0	0	37	55	59
04:00	0	0	0	6	19	11	0	0	0	0	0	0	0	36	54	57
05:00	0	0	0	0	21	2	0	0	0	0	0	0	0	23	49	50
06:00	0	0	1	3	23	13	0	0	0	0	0	0	0	40	53	57
07:00	0	0	1	8	29	14	0	1	0	**1**	0	0	0	54	53	58
08:00	0	0	1	36	80	**21**	3	0	0	0	0	0	0	141	50	57
09:00	0	0	8	48	**116**	20	0	1	0	1	0	0	0	194	49	55
10:00	0	1	16	79	97	17	1	0	0	0	0	0	0	**211**	48	53
11:00	1	1	**19**	**96**	85	8	0	1	0	0	0	0	0	211	47	49
12 PM	0	1	17	94	67	5	**1**	0	**1**	0	0	0	0	**186**	46	49
13:00	0	2	**21**	**103**	51	2	1	**2**	0	0	0	0	0	182	45	49
14:00	**1**	0	14	78	64	5	0	2	0	**1**	**1**	0	0	166	47	50
15:00	1	1	5	59	46	6	1	1	1	0	0	0	0	121	47	52
16:00	0	0	5	48	41	4	0	0	0	0	0	0	0	98	47	49
17:00	0	**3**	11	61	**73**	11	1	0	0	0	0	0	0	160	48	52
18:00	1	1	12	39	51	9	0	1	1	0	0	0	0	115	48	54
19:00	0	0	14	65	69	2	0	0	0	0	0	0	0	150	46	48
20:00	0	2	15	36	39	4	1	0	1	0	0	0	0	98	47	50
21:00	1	0	7	38	60	3	0	2	0	0	0	0	0	111	47	49
22:00	0	0	2	28	31	**12**	0	0	0	0	0	0	0	73	50	55
23:00	0	0	3	12	18	4	0	0	0	0	0	0	0	37	47	51
Total	6	15	190	994	1162	202	14	20	7	3	2	0	0	2615		
Percent	0.2%	0.6%	7.3%	38.0%	44.4%	7.7%	0.5%	0.8%	0.3%	0.1%	0.1%	0.0%	0.0%			
AM Peak	00:00	00:00	11:00	11:00	09:00	08:00	00:00	00:00	00:00	07:00	00:00			10:00		
Vol.	1	2	19	96	116	21	5	3	1	1	1			211		
PM Peak	14:00	17:00	13:00	13:00	17:00	22:00	12:00	13:00	12:00	14:00	14:00			12:00		
Vol.	1	3	21	103	73	12	1	2	1	1	1			186		
Grand Total	15	61	733	4611	5775	811	71	38	12	5	2	0	0	12134		
Percent	0.1%	0.5%	6.0%	38.0%	47.6%	6.7%	0.6%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	32 KPH
	50th Percentile :	41 KPH
	85th Percentile :	48 KPH
	95th Percentile :	54 KPH
Stats	10 KPH Pace Speed :	40-49 KPH
	Number in Pace :	5775
	Percent in Pace :	47.6%
	Number of Vehicles > 40 KPH :	6136
	Percent of Vehicles > 40 KPH :	50.6%
	Mean Speed(Average) :	40 KPH

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	0	9	22	44	7	**3**	0	0	0	0	0	0	85	49	55
01:00	**1**	0	4	13	42	4	1	0	0	0	0	0	0	65	48	51
02:00	0	1	0	12	21	12	1	**1**	0	0	0	0	0	48	54	59
03:00	0	0	1	5	6	11	1	0	0	0	0	0	0	24	56	59
04:00	0	0	0	7	5	3	0	0	0	0	0	0	0	15	50	51
05:00	0	1	1	9	23	1	1	0	0	0	0	0	0	36	48	49
06:00	0	0	2	15	46	12	1	0	0	0	0	0	0	76	50	56
07:00	0	0	5	47	98	**23**	1	0	0	0	0	0	0	174	49	55
08:00	0	1	11	107	155	22	0	0	0	0	0	0	0	296	48	52
09:00	0	0	38	209	220	19	1	1	0	0	0	0	0	488	47	49
10:00	1	**3**	82	370	**232**	10	1	0	**1**	0	0	0	0	700	45	48
11:00	0	3	**151**	**382**	166	11	1	0	0	0	0	0	0	**714**	44	48
12 PM	**1**	16	**220**	363	132	0	1	0	0	0	0	0	0	733	41	47
13:00	1	**23**	198	375	119	3	**2**	0	0	0	0	0	0	721	41	47
14:00	0	16	195	344	132	4	1	0	0	**1**	0	0	0	693	42	47
15:00	1	7	199	**381**	163	5	1	**1**	0	0	0	0	0	**758**	43	48
16:00	1	6	159	360	201	14	1	0	0	0	0	0	0	742	45	48
17:00	0	4	129	325	178	17	0	1	0	0	0	0	0	654	45	49
18:00	0	2	101	314	215	**20**	2	0	0	0	0	0	0	654	46	49
19:00	0	8	151	328	193	13	0	0	0	0	0	0	0	693	45	48
20:00	0	6	82	343	182	15	1	0	0	0	0	0	0	629	45	49
21:00	0	5	69	271	**256**	20	2	0	0	0	0	0	0	623	47	49
22:00	0	0	41	220	203	11	2	0	0	0	0	0	0	477	47	49
23:00	0	3	10	167	154	10	2	0	0	0	0	0	0	346	47	49
Total	6	105	1858	4989	3186	267	27	4	1	1	0	0	0	10444		
Percent	0.1%	1.0%	17.8%	47.8%	30.5%	2.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	01:00	10:00	11:00	11:00	10:00	07:00	00:00	02:00	10:00					11:00		
Vol.	1	3	151	382	232	23	3	1	1					714		
PM Peak	12:00	13:00	12:00	15:00	21:00	18:00	13:00	15:00		14:00				15:00		
Vol.	1	23	220	381	256	20	2	1		1				758		

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/01/17	0	1	13	61	158	13	0	1	0	0	0	0	0	247	48	50
01:00	**1**	1	6	56	134	12	1	0	0	0	0	0	0	211	48	50
02:00	1	1	9	76	50	12	0	**2**	0	0	0	0	0	151	48	53
03:00	0	1	0	15	30	**62**	1	0	0	0	0	0	0	109	57	59
04:00	0	0	1	24	14	18	1	0	0	0	0	0	0	58	54	57
05:00	0	0	0	27	51	7	0	0	0	0	0	0	0	85	48	52
06:00	0	0	2	15	47	11	0	0	0	0	0	0	0	75	49	55
07:00	0	1	7	60	94	23	1	0	0	0	0	0	0	186	49	55
08:00	0	1	17	181	190	25	0	1	**1**	**1**	0	0	0	417	48	52
09:00	1	4	56	303	**258**	18	**4**	0	1	1	0	0	0	646	47	49
10:00	0	**10**	102	**392**	220	22	2	2	0	0	0	0	0	**750**	46	49
11:00	0	10	**114**	381	193	11	4	1	0	0	0	0	0	714	45	48
12 PM	0	15	154	314	112	4	1	0	0	0	0	0	0	600	42	47
13:00	**2**	**22**	**172**	321	104	3	1	0	0	0	0	0	0	625	41	47
14:00	0	17	134	288	113	8	1	1	0	0	0	0	0	562	43	48
15:00	2	9	162	329	137	13	1	**2**	0	0	0	0	0	655	43	48
16:00	1	9	164	289	133	13	1	0	0	0	0	0	0	610	43	48
17:00	1	6	116	343	189	13	1	0	0	0	0	0	0	669	45	48
18:00	0	7	130	335	183	20	2	0	0	0	0	0	0	677	45	49
19:00	0	11	114	338	172	13	1	0	0	0	0	0	0	649	45	48
20:00	0	4	85	**352**	208	22	0	0	0	0	0	0	0	671	46	49
21:00	1	5	63	317	**276**	29	1	1	0	0	0	0	0	**693**	47	49
22:00	0	1	59	224	275	30	**5**	0	0	0	0	0	0	594	47	51
23:00	0	5	17	189	240	**37**	1	1	0	0	0	0	0	490	48	53
Total	10	141	1697	5230	3581	439	30	12	2	2	0	0	0	11144		
Percent	0.1%	1.3%	15.2%	46.9%	32.1%	3.9%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	01:00	10:00	11:00	10:00	09:00	03:00	09:00	02:00	08:00	08:00				10:00		
Vol.	1	10	114	392	258	62	4	2	1	1				750		
PM Peak	13:00	13:00	13:00	20:00	21:00	23:00	22:00	15:00						21:00		
Vol.	2	22	172	352	276	37	5	2						693		

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/02/17	**1**	3	24	171	192	16	4	1	0	0	0	0	0	412	47	49
01:00	0	2	7	91	152	30	**12**	**3**	**1**	0	0	0	0	298	50	60
02:00	1	2	5	84	173	50	1	1	1	0	0	0	0	318	50	57
03:00	1	1	10	24	138	**60**	4	0	0	0	0	0	0	238	54	58
04:00	0	0	3	22	50	59	2	1	0	0	0	0	0	137	56	59
05:00	0	0	2	29	25	30	1	0	0	0	0	0	0	87	55	58
06:00	0	0	1	24	66	25	1	0	0	0	0	0	0	117	52	57
07:00	0	3	14	77	108	27	1	0	0	0	0	0	0	230	49	55
08:00	0	1	45	175	233	39	2	0	0	0	0	0	0	495	48	53
09:00	1	2	64	317	**294**	20	0	0	0	0	0	0	0	698	47	49
10:00	0	4	94	**393**	241	24	2	1	1	0	0	0	0	**760**	46	49
11:00	0	**10**	**96**	352	179	14	3	1	0	0	0	0	0	655	45	49
12 PM	0	7	127	299	116	4	0	0	0	0	0	0	0	553	43	47
13:00	1	3	136	261	102	1	0	0	**1**	0	0	0	0	505	42	47
14:00	1	2	131	299	116	3	1	**1**	0	0	0	0	0	554	43	47
15:00	0	5	**159**	339	110	6	1	0	0	0	0	0	0	620	42	47
16:00	0	2	79	365	186	9	0	0	0	0	0	0	0	641	45	48
17:00	0	5	66	340	178	9	2	1	0	0	0	0	0	601	45	48
18:00	0	0	117	331	183	18	0	1	0	0	0	0	0	650	45	49
19:00	**2**	1	134	386	168	7	2	0	0	0	0	0	0	700	44	48
20:00	0	7	115	**405**	211	10	4	0	0	0	0	0	0	**752**	45	48
21:00	0	**10**	81	335	216	13	**5**	0	0	0	0	0	0	660	46	49
22:00	0	2	43	193	**284**	11	1	1	0	0	0	0	0	535	47	49
23:00	0	6	7	155	253	**49**	4	0	0	0	0	0	0	474	49	55
Total	8	78	1560	5467	3974	534	53	12	4	0	0	0	0	11690		
Percent	0.1%	0.7%	13.3%	46.8%	34.0%	4.6%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	00:00	11:00	11:00	10:00	09:00	03:00	01:00	01:00	01:00					10:00		
Vol.	1	10	96	393	294	60	12	3	1					760		
PM Peak	19:00	21:00	15:00	20:00	22:00	23:00	21:00	14:00	13:00					20:00		
Vol.	2	10	159	405	284	49	5	1	1					752		

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 40
Station ID: D76
Mosley St between 1st St & Willow St

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	**2**	3	52	150	84	**34**	**12**	**3**	**1**	0	**1**	0	0	342	49	59
01:00	0	0	2	39	52	6	1	3	1	0	0	0	0	104	48	55
02:00	0	0	1	23	38	5	1	1	1	0	0	0	0	70	48	53
03:00	0	1	2	14	21	17	0	2	0	0	0	0	0	57	54	58
04:00	0	1	2	39	55	14	0	0	0	0	0	0	0	111	49	53
05:00	0	0	1	30	44	7	0	0	0	0	0	0	0	82	48	52
06:00	0	0	1	26	58	25	0	0	0	0	0	0	0	110	52	56
07:00	0	1	9	52	74	20	1	1	0	**1**	0	0	0	159	49	57
08:00	1	1	19	141	148	27	3	0	0	0	0	0	0	340	48	54
09:00	1	**9**	59	289	239	29	0	2	0	1	0	0	0	629	47	50
10:00	0	9	89	368	**241**	31	3	0	0	0	0	0	0	**741**	46	49
11:00	2	9	**105**	**383**	178	16	2	2	0	0	0	0	0	697	45	49
12 PM	1	9	139	341	103	8	2	0	**1**	0	0	0	0	604	42	48
13:00	0	12	**183**	291	89	4	2	**3**	0	0	0	0	0	584	41	47
14:00	**2**	3	126	354	138	11	4	3	0	**1**	**1**	0	0	643	44	49
15:00	1	7	150	341	112	8	2	1	1	0	0	0	0	623	42	48
16:00	1	11	128	347	135	16	2	1	0	0	0	0	0	641	44	48
17:00	0	**14**	122	388	190	22	**5**	1	0	0	0	0	0	742	45	49
18:00	1	6	139	**418**	178	**29**	1	2	1	0	0	0	0	**775**	45	49
19:00	0	5	154	385	188	11	1	3	1	0	0	0	0	748	44	48
20:00	1	5	80	393	**211**	18	2	0	1	0	0	0	0	711	45	49
21:00	1	5	87	280	201	18	2	2	0	0	0	0	0	596	46	49
22:00	0	4	26	104	125	19	0	0	0	0	0	0	0	278	48	52
23:00	0	0	11	42	58	8	1	0	0	0	0	0	0	120	48	52
Total	14	115	1687	5238	2960	403	47	30	8	3	2	0	0	10507		
Percent	0.1%	1.1%	16.1%	49.9%	28.2%	3.8%	0.4%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	00:00	09:00	11:00	11:00	10:00	00:00	00:00	00:00	00:00	07:00	00:00			10:00		
Vol.	2	9	105	383	241	34	12	3	1	1	1			741		
PM Peak	14:00	17:00	13:00	18:00	20:00	18:00	17:00	13:00	12:00	14:00	14:00			18:00		
Vol.	2	14	183	418	211	29	5	3	1	1	1			775		
Grand Total	38	439	6802	20924	13701	1643	157	58	15	6	2	0	0	43785		
Percent	0.1%	1.0%	15.5%	47.8%	31.3%	3.8%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	28 KPH
	50th Percentile :	36 KPH
	85th Percentile :	46 KPH
	95th Percentile :	49 KPH
Stats	10 KPH Pace Speed :	30-39 KPH
	Number in Pace :	20924
	Percent in Pace :	47.8%
	Number of Vehicles > 40 KPH :	14211
	Percent of Vehicles > 40 KPH :	32.5%
	Mean Speed(Average) :	37 KPH

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	14	1	0	0	0	0	0	0	0	0	0	0	15
01:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
04:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
05:00	0	5	3	0	0	0	0	0	0	0	0	0	0	8
06:00	0	12	4	0	0	0	0	0	0	0	0	0	0	16
07:00	0	25	9	0	2	1	0	0	0	0	0	0	0	37
08:00	0	35	9	0	2	0	0	2	0	0	1	0	0	49
09:00	0	72	21	0	**3**	**4**	0	1	0	0	3	0	1	105
10:00	**2**	118	**27**	**1**	2	1	**1**	5	**2**	0	**12**	0	**6**	**177**
11:00	1	**128**	25	0	2	0	1	**6**	1	0	8	**1**	3	176
12 PM	2	123	31	0	**4**	0	0	7	1	0	3	0	1	172
13:00	5	131	**36**	0	1	1	0	9	**3**	1	4	**2**	**5**	198
14:00	**7**	143	24	0	4	**5**	1	5	2	1	11	0	2	205
15:00	6	135	19	0	1	1	**2**	6	3	0	5	0	3	181
16:00	3	139	26	0	1	0	1	**11**	3	0	11	0	3	198
17:00	0	**162**	22	0	2	0	1	5	0	1	**16**	1	3	**213**
18:00	1	134	25	0	2	0	0	4	3	**2**	6	2	0	179
19:00	7	148	33	0	1	1	0	5	2	1	5	0	2	205
20:00	5	126	34	0	1	0	0	4	1	0	7	0	3	181
21:00	3	112	25	0	0	0	1	10	1	0	4	0	1	157
22:00	2	88	20	0	0	0	0	2	1	1	3	0	1	118
23:00	0	52	10	0	0	0	0	1	0	0	2	0	1	66
Day Total	44	1926	410	1	28	14	8	83	23	7	101	6	35	2686
Percent	1.6%	71.7%	15.3%	0.0%	1.0%	0.5%	0.3%	3.1%	0.9%	0.3%	3.8%	0.2%	1.3%	
AM Peak	10:00	11:00	10:00	10:00	09:00	09:00	10:00	11:00	10:00		10:00	11:00	10:00	10:00
Vol.	2	128	27	1	3	4	1	6	2		12	1	6	177
PM Peak	14:00	17:00	13:00		12:00	14:00	15:00	16:00	13:00	18:00	17:00	13:00	13:00	17:00
Vol.	7	162	36		4	5	2	11	3	2	16	2	5	213

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Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	2	44	4	0	0	0	0	0	0	0	0	0	1	51
01:00	0	27	7	0	0	0	0	0	0	0	0	0	0	34
02:00	0	25	2	0	0	0	0	0	0	0	1	0	0	28
03:00	0	20	5	0	0	0	0	0	0	0	0	0	0	25
04:00	1	15	0	0	0	1	0	1	0	0	0	0	0	18
05:00	0	13	2	0	0	0	0	0	0	0	0	0	0	15
06:00	0	21	2	0	1	0	0	1	0	0	0	0	0	25
07:00	3	39	11	0	1	0	0	0	0	0	0	0	0	54
08:00	1	55	15	0	2	0	0	2	0	0	2	0	0	77
09:00	**5**	108	19	0	2	1	0	7	0	0	4	0	2	148
10:00	2	**126**	24	0	2	0	0	**9**	**3**	**3**	4	1	**5**	179
11:00	1	120	**34**	**1**	**3**	**3**	**1**	8	1	1	**18**	**3**	4	**198**
12 PM	0	143	28	0	1	0	1	9	3	0	17	0	6	208
13:00	3	118	28	0	1	1	0	13	**6**	2	14	1	8	195
14:00	3	132	29	0	1	0	0	11	3	0	14	0	7	200
15:00	1	168	25	0	0	0	**3**	8	3	0	**23**	1	7	239
16:00	**5**	184	30	0	1	1	2	19	1	1	14	0	7	265
17:00	2	**194**	27	0	0	**2**	1	13	3	2	16	1	**11**	272
18:00	1	194	26	**1**	**2**	0	1	21	2	2	8	**5**	11	**274**
19:00	4	180	20	0	1	0	2	11	2	**4**	13	1	8	246
20:00	2	142	25	0	1	1	3	8	5	0	8	2	4	201
21:00	1	108	24	0	0	0	1	5	3	0	8	0	5	155
22:00	2	83	**41**	0	0	2	1	**23**	1	2	7	1	7	170
23:00	2	54	30	0	0	1	3	11	0	2	4	2	6	115
Day Total	41	2313	458	2	19	13	19	180	36	19	175	18	99	3392
Percent	1.2%	68.2%	13.5%	0.1%	0.6%	0.4%	0.6%	5.3%	1.1%	0.6%	5.2%	0.5%	2.9%	
AM Peak	09:00	10:00	11:00	11:00	11:00	11:00	11:00	10:00	10:00	10:00	11:00	11:00	10:00	11:00
Vol.	5	126	34	1	3	3	1	9	3	3	18	3	5	198
PM Peak	16:00	17:00	22:00	18:00	18:00	17:00	15:00	22:00	13:00	19:00	15:00	18:00	17:00	18:00
Vol.	5	194	41	1	2	2	3	23	6	4	23	5	11	274

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	2	82	17	0	0	0	0	2	0	0	2	**1**	0	106
01:00	0	55	5	0	0	0	0	1	0	0	0	0	0	61
02:00	0	46	3	0	0	0	0	0	0	0	0	0	0	49
03:00	1	25	5	0	0	0	0	0	0	0	0	0	0	31
04:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
05:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
06:00	0	21	6	0	1	0	0	0	1	0	0	0	0	29
07:00	3	32	15	0	**2**	0	0	1	0	0	0	0	0	53
08:00	3	68	17	0	2	1	0	1	0	0	2	0	0	94
09:00	3	130	29	0	2	1	1	5	2	0	12	0	5	190
10:00	5	**177**	**40**	0	0	**2**	**4**	11	1	**2**	**28**	1	**8**	**279**
11:00	**6**	150	25	0	1	0	0	**18**	**5**	1	25	1	8	240
12 PM	4	185	32	0	1	1	2	16	3	**7**	29	4	14	298
13:00	3	163	28	0	**4**	3	3	17	0	4	29	2	23	279
14:00	1	141	25	**2**	3	0	1	14	3	1	13	1	11	216
15:00	3	174	**36**	0	0	1	0	12	0	0	12	2	7	247
16:00	2	205	29	0	1	2	2	17	2	1	**30**	1	10	302
17:00	4	198	29	0	2	0	2	13	**7**	5	17	2	9	288
18:00	**6**	**233**	33	0	2	**4**	1	**32**	6	4	15	**11**	**39**	**386**
19:00	3	190	26	0	1	2	**5**	20	0	0	10	1	16	274
20:00	1	157	18	0	0	1	1	4	0	0	5	0	2	189
21:00	2	155	23	0	1	0	0	6	0	0	6	0	2	195
22:00	2	98	16	0	0	0	0	2	2	1	3	0	1	125
23:00	0	48	10	0	0	0	0	4	0	0	1	0	0	63
Day Total	54	2759	469	2	23	18	22	196	32	26	239	27	155	4022
Percent	1.3%	68.6%	11.7%	0.0%	0.6%	0.4%	0.5%	4.9%	0.8%	0.6%	5.9%	0.7%	3.9%	
AM Peak	11:00	10:00	10:00		07:00	10:00	10:00	11:00	11:00	10:00	10:00	00:00	10:00	10:00
Vol.	6	177	40		2	2	4	18	5	2	28	1	8	279
PM Peak	18:00	18:00	15:00	14:00	13:00	18:00	19:00	18:00	17:00	12:00	16:00	18:00	18:00	18:00
Vol.	6	233	36	2	4	4	5	32	7	7	30	11	39	386

Ontario Traffic, Inc.
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Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	**2**	26	6	0	0	0	0	2	0	0	0	0	0	36
01:00	1	29	4	0	0	0	0	0	0	0	0	0	0	34
02:00	0	31	1	0	0	0	1	0	0	0	0	0	0	33
03:00	0	26	2	0	0	0	0	0	0	0	0	0	0	28
04:00	0	14	3	0	0	1	0	0	0	0	0	0	0	18
05:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
06:00	0	14	1	0	2	0	0	0	0	0	0	0	0	17
07:00	0	39	6	0	1	0	0	1	0	0	0	0	0	47
08:00	0	66	16	0	2	0	0	2	1	0	2	0	0	89
09:00	0	125	23	0	**4**	2	0	11	1	0	7	0	3	176
10:00	0	**194**	19	0	3	1	0	**12**	1	0	**16**	**1**	3	**250**
11:00	1	155	**24**	**1**	0	**3**	**3**	9	**2**	**2**	11	1	**6**	218
12 PM	3	139	28	0	2	**2**	0	8	2	1	22	1	4	212
13:00	6	144	26	0	1	0	1	12	3	1	12	2	6	214
14:00	5	161	29	0	1	0	1	15	4	3	19	4	6	248
15:00	**9**	170	30	0	1	0	0	13	3	1	**25**	1	6	259
16:00	6	219	22	0	2	1	2	17	2	2	10	1	**14**	298
17:00	6	233	31	0	**3**	1	2	16	**7**	**6**	15	2	9	331
18:00	9	**260**	26	0	3	1	**3**	**18**	1	1	11	0	12	**345**
19:00	5	235	**38**	0	1	2	1	18	3	5	11	**6**	10	335
20:00	1	239	26	0	2	1	0	15	3	0	5	0	6	298
21:00	2	168	30	0	0	2	0	8	1	0	5	0	2	218
22:00	1	59	8	0	0	0	0	2	0	0	0	0	0	70
23:00	0	25	1	0	0	0	0	0	0	0	0	0	0	26
Day Total	57	2783	401	1	28	17	14	179	34	22	171	19	87	3813
Percent	1.5%	73.0%	10.5%	0.0%	0.7%	0.4%	0.4%	4.7%	0.9%	0.6%	4.5%	0.5%	2.3%	
AM Peak	00:00	10:00	11:00	11:00	09:00	11:00	11:00	10:00	11:00	11:00	10:00	10:00	11:00	10:00
Vol.	2	194	24	1	4	3	3	12	2	2	16	1	6	250
PM Peak	15:00	18:00	19:00		17:00	12:00	18:00	18:00	17:00	17:00	15:00	19:00	16:00	18:00
Vol.	9	260	38		3	2	3	18	7	6	25	6	14	345
Grand Total	196	9781	1738	6	98	62	63	638	125	74	686	70	376	13913
Percent	1.4%	70.3%	12.5%	0.0%	0.7%	0.4%	0.5%	4.6%	0.9%	0.5%	4.9%	0.5%	2.7%	

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Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	13	3	0	0	0	0	0	0	0	0	0	0	16
01:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
02:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
03:00	0	4	0	0	0	0	0	0	1	0	0	0	0	5
04:00	0	2	3	0	0	0	0	0	0	0	0	0	0	5
05:00	**1**	2	1	0	0	1	0	0	0	0	0	0	0	5
06:00	0	14	5	0	1	0	0	0	0	0	0	0	0	20
07:00	1	26	16	0	0	0	0	0	1	0	0	0	1	45
08:00	1	50	24	**1**	**3**	2	0	4	1	0	0	0	0	86
09:00	1	101	38	0	2	1	0	2	0	**1**	1	0	1	148
10:00	0	124	40	0	0	1	0	**7**	**2**	0	3	0	**2**	179
11:00	1	**155**	**60**	0	1	**3**	**1**	4	0	0	**6**	**1**	0	**232**
12 PM	0	175	51	0	0	**1**	0	5	**2**	1	5	**2**	**4**	246
13:00	5	184	61	0	**1**	0	0	**15**	2	1	5	1	1	276
14:00	5	**205**	57	0	0	1	0	12	0	0	**11**	1	2	**294**
15:00	**9**	186	62	0	1	0	0	15	0	1	6	1	3	284
16:00	2	158	50	**1**	1	0	**1**	7	1	1	6	0	1	229
17:00	6	133	47	0	0	0	0	9	1	1	6	0	4	207
18:00	5	171	47	0	1	0	0	10	0	0	5	0	0	239
19:00	7	157	**68**	0	0	0	0	8	1	**2**	5	1	1	250
20:00	5	156	55	0	1	0	1	8	0	0	2	1	0	229
21:00	6	98	36	0	1	0	0	6	0	1	3	0	1	152
22:00	3	81	27	0	0	0	0	5	0	0	2	0	1	119
23:00	2	46	15	0	0	1	0	3	0	0	0	1	2	70
Day Total	60	2254	770	2	13	11	3	120	12	9	66	9	24	3353
Percent	1.8%	67.2%	23.0%	0.1%	0.4%	0.3%	0.1%	3.6%	0.4%	0.3%	2.0%	0.3%	0.7%	
AM Peak	05:00	11:00	11:00	08:00	08:00	11:00	11:00	10:00	10:00	09:00	11:00	11:00	10:00	11:00
Vol.	1	155	60	1	3	3	1	7	2	1	6	1	2	232
PM Peak	15:00	14:00	19:00	16:00	13:00	12:00	16:00	13:00	12:00	19:00	14:00	12:00	12:00	14:00
Vol.	9	205	68	1	1	1	1	15	2	2	11	2	4	294

Ontario Traffic, Inc.
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Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	0	31	7	0	0	0	0	0	0	0	0	0	0	38
01:00	1	16	11	0	0	0	0	0	0	0	0	0	0	28
02:00	0	22	4	0	0	0	0	0	0	0	0	0	0	26
03:00	0	18	4	0	0	0	0	1	0	0	0	0	0	23
04:00	0	16	4	0	0	0	0	0	0	0	0	0	0	20
05:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
06:00	3	21	11	0	0	0	0	0	0	0	0	0	0	35
07:00	3	42	27	0	0	0	0	0	0	0	0	0	0	72
08:00	4	92	29	0	**1**	0	0	2	0	0	2	0	0	130
09:00	**6**	137	44	0	0	0	0	6	0	0	7	0	2	202
10:00	1	181	45	0	0	0	**1**	**17**	0	0	4	1	**3**	253
11:00	5	**223**	**78**	0	0	0	1	16	0	**1**	**17**	**4**	2	**347**
12 PM	3	222	74	0	0	**2**	0	21	1	0	**20**	0	5	348
13:00	**7**	244	73	0	0	2	0	**22**	1	0	12	3	4	368
14:00	7	**263**	**83**	0	0	0	1	20	1	0	7	0	**6**	**388**
15:00	3	245	64	0	**1**	1	**3**	13	1	**1**	12	4	5	353
16:00	7	217	54	0	1	0	0	17	0	1	14	2	5	318
17:00	4	195	56	0	0	0	0	18	1	0	15	1	6	296
18:00	4	171	62	0	0	1	2	14	1	0	7	**5**	6	273
19:00	4	188	53	0	0	0	0	18	1	1	9	0	3	277
20:00	4	170	68	0	1	0	0	11	0	0	7	1	3	265
21:00	1	216	65	0	0	0	0	15	**2**	0	3	0	6	308
22:00	0	65	15	0	0	1	0	7	2	0	7	0	2	99
23:00	2	50	21	0	0	0	0	1	0	0	1	0	2	77
Day Total	69	3053	954	0	4	7	8	219	11	4	144	21	60	4554
Percent	1.5%	67.0%	20.9%	0.0%	0.1%	0.2%	0.2%	4.8%	0.2%	0.1%	3.2%	0.5%	1.3%	
AM Peak	09:00	11:00	11:00		08:00		10:00	10:00		11:00	11:00	11:00	10:00	11:00
Vol.	6	223	78		1		1	17		1	17	4	3	347
PM Peak	13:00	14:00	14:00		15:00	12:00	15:00	13:00	21:00	15:00	12:00	18:00	14:00	14:00
Vol.	7	263	83		1	2	3	22	2	1	20	5	6	388

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Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	0	44	13	0	0	0	0	3	0	0	1	0	2	63
01:00	0	26	9	0	0	0	0	1	0	0	0	0	0	36
02:00	0	19	4	0	0	**1**	0	1	0	0	0	0	0	25
03:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
04:00	0	15	3	0	0	0	0	0	0	0	0	0	0	18
05:00	0	8	5	0	0	0	0	0	0	0	0	0	0	13
06:00	0	6	7	0	0	0	0	1	0	0	0	0	0	14
07:00	1	45	25	0	**1**	0	0	1	0	0	0	0	1	74
08:00	4	87	18	0	0	0	0	1	0	0	2	0	0	112
09:00	7	178	39	0	1	0	0	5	0	0	5	2	1	238
10:00	**15**	230	52	0	0	0	0	22	**2**	0	**13**	**6**	4	344
11:00	15	**309**	**69**	0	1	0	0	**32**	1	**3**	13	2	**13**	**458**
12 PM	**11**	**304**	66	0	0	**2**	**4**	**33**	**3**	0	**16**	5	**10**	**454**
13:00	10	300	**77**	**1**	**1**	0	1	22	2	1	14	**7**	7	443
14:00	7	304	65	0	0	0	1	25	1	1	12	2	5	423
15:00	9	270	56	0	0	0	0	28	0	1	14	0	3	381
16:00	11	195	45	0	0	0	0	13	1	1	10	2	7	285
17:00	8	164	39	0	0	0	0	12	3	0	9	0	2	237
18:00	2	91	23	0	1	0	1	9	1	0	8	5	10	151
19:00	3	110	25	0	0	0	0	4	1	**2**	5	1	4	155
20:00	0	126	39	0	1	0	0	5	0	0	5	0	3	179
21:00	2	96	28	0	0	0	1	3	0	0	4	0	1	135
22:00	2	82	23	0	0	1	0	1	0	0	1	0	1	111
23:00	1	42	11	0	0	0	0	0	0	0	0	0	0	54
Day Total	108	3064	744	1	6	4	8	222	15	9	132	32	74	4419
Percent	2.4%	69.3%	16.8%	0.0%	0.1%	0.1%	0.2%	5.0%	0.3%	0.2%	3.0%	0.7%	1.7%	
AM Peak	10:00	11:00	11:00		07:00	02:00		11:00	10:00	11:00	10:00	10:00	11:00	11:00
Vol.	15	309	69		1	1		32	2	3	13	6	13	458
PM Peak	12:00	12:00	13:00	13:00	13:00	12:00	12:00	12:00	12:00	19:00	12:00	13:00	12:00	12:00
Vol.	11	304	77	1	1	2	4	33	3	2	16	7	10	454

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Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	1	27	5	0	0	0	0	0	0	0	0	0	0	33
01:00	1	15	5	0	0	0	0	0	0	0	0	0	0	21
02:00	1	12	4	0	0	0	0	0	0	0	0	0	0	17
03:00	0	6	1	0	0	**1**	0	0	0	0	0	0	0	8
04:00	0	5	1	0	0	1	0	0	0	0	0	0	0	7
05:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
06:00	0	14	7	0	0	1	0	0	1	0	0	0	0	23
07:00	2	30	11	0	**1**	1	0	0	**2**	0	2	0	0	49
08:00	1	71	27	0	1	1	0	1	0	0	1	0	0	103
09:00	3	113	36	0	0	0	**1**	3	0	0	9	0	4	169
10:00	**8**	213	45	**1**	1	1	1	10	2	0	**13**	0	**7**	302
11:00	6	**249**	**56**	0	1	0	0	**11**	1	**3**	7	**2**	5	**341**
12 PM	3	270	66	0	0	1	0	14	**1**	1	15	1	3	375
13:00	15	**284**	**75**	0	0	1	0	**26**	0	**2**	9	**3**	7	**422**
14:00	**17**	283	68	0	1	**3**	1	18	0	2	12	0	6	411
15:00	10	267	49	0	1	0	**2**	21	0	1	10	1	9	371
16:00	16	172	44	0	1	1	0	16	0	1	14	1	**11**	277
17:00	11	149	41	0	0	0	1	10	1	2	**16**	3	3	237
18:00	3	119	40	0	1	0	0	8	1	0	5	2	7	186
19:00	9	119	38	0	0	0	0	5	0	0	6	0	0	177
20:00	3	124	33	0	**2**	0	1	8	1	1	2	2	2	179
21:00	6	66	11	0	0	0	0	4	0	1	6	0	1	95
22:00	2	30	5	0	0	0	0	0	0	0	0	0	0	37
23:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
Day Total	118	2663	673	1	10	12	7	155	10	14	127	15	65	3870
Percent	3.0%	68.8%	17.4%	0.0%	0.3%	0.3%	0.2%	4.0%	0.3%	0.4%	3.3%	0.4%	1.7%	
AM Peak	10:00	11:00	11:00	10:00	07:00	03:00	09:00	11:00	07:00	11:00	10:00	11:00	10:00	11:00
Vol.	8	249	56	1	1	1	1	11	2	3	13	2	7	341
PM Peak	14:00	13:00	13:00		20:00	14:00	15:00	13:00	12:00	13:00	17:00	13:00	16:00	13:00
Vol.	17	284	75		2	3	2	26	1	2	16	3	11	422
Grand Total	355	11034	3141	4	33	34	26	716	48	36	469	77	223	16196
Percent	2.2%	68.1%	19.4%	0.0%	0.2%	0.2%	0.2%	4.4%	0.3%	0.2%	2.9%	0.5%	1.4%	

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	27	4	0	0	0	0	0	0	0	0	0	0	31
01:00	0	18	4	0	0	0	0	0	0	0	0	0	0	22
02:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
03:00	0	10	1	0	0	0	0	0	1	0	0	0	0	12
04:00	0	6	6	0	0	0	0	0	0	0	0	0	0	12
05:00	1	7	4	0	0	1	0	0	0	0	0	0	0	13
06:00	0	26	9	0	1	0	0	0	0	0	0	0	0	36
07:00	1	51	25	0	2	1	0	0	1	0	0	0	1	82
08:00	1	85	33	**1**	**5**	2	0	6	1	0	1	0	0	135
09:00	1	173	59	0	5	**5**	0	3	0	**1**	4	0	2	253
10:00	**2**	242	67	1	2	2	1	**12**	**4**	0	**15**	0	**8**	356
11:00	2	**283**	**85**	0	3	3	**2**	10	1	0	14	**2**	3	**408**
12 PM	2	298	82	0	**4**	1	0	12	3	1	8	2	5	418
13:00	10	315	97	0	2	1	0	**24**	**5**	2	9	**3**	6	474
14:00	12	**348**	81	0	4	**6**	1	17	2	1	**22**	1	4	**499**
15:00	**15**	321	81	0	2	1	**2**	21	3	1	11	1	6	465
16:00	5	297	76	**1**	2	0	2	18	4	1	17	0	4	427
17:00	6	295	69	0	2	0	1	14	1	2	22	1	**7**	420
18:00	6	305	72	0	3	0	0	14	3	2	11	2	0	418
19:00	14	305	**101**	0	1	1	0	13	3	**3**	10	1	3	455
20:00	10	282	89	0	2	0	1	12	1	0	9	1	3	410
21:00	9	210	61	0	1	0	1	16	1	1	7	0	2	309
22:00	5	169	47	0	0	0	0	7	1	1	5	0	2	237
23:00	2	98	25	0	0	1	0	4	0	0	2	1	3	136
Day Total	104	4180	1180	3	41	25	11	203	35	16	167	15	59	6039
Percent	1.7%	69.2%	19.5%	0.0%	0.7%	0.4%	0.2%	3.4%	0.6%	0.3%	2.8%	0.2%	1.0%	
AM Peak	10:00	11:00	11:00	08:00	08:00	09:00	11:00	10:00	10:00	09:00	10:00	11:00	10:00	11:00
Vol.	2	283	85	1	5	5	2	12	4	1	15	2	8	408
PM Peak	15:00	14:00	19:00	16:00	12:00	14:00	15:00	13:00	13:00	19:00	14:00	13:00	17:00	14:00
Vol.	15	348	101	1	4	6	2	24	5	3	22	3	7	499

Ontario Traffic, Inc.
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Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	2	75	11	0	0	0	0	0	0	0	0	0	1	89
01:00	1	43	18	0	0	0	0	0	0	0	0	0	0	62
02:00	0	47	6	0	0	0	0	0	0	0	1	0	0	54
03:00	0	38	9	0	0	0	0	1	0	0	0	0	0	48
04:00	1	31	4	0	0	1	0	1	0	0	0	0	0	38
05:00	0	21	4	0	0	0	0	0	0	0	0	0	0	25
06:00	3	42	13	0	1	0	0	1	0	0	0	0	0	60
07:00	6	81	38	0	1	0	0	0	0	0	0	0	0	126
08:00	5	147	44	0	**3**	0	0	4	0	0	4	0	0	207
09:00	**11**	245	63	0	2	1	0	13	0	0	11	0	4	350
10:00	3	307	69	0	2	0	1	**26**	**3**	**3**	8	2	**8**	432
11:00	6	**343**	**112**	**1**	3	**3**	**2**	24	1	2	**35**	**7**	6	**545**
12 PM	3	365	102	0	1	2	1	30	4	0	**37**	0	11	556
13:00	10	362	101	0	1	**3**	0	35	**7**	2	26	4	12	563
14:00	10	395	**112**	0	1	0	1	31	4	0	21	0	13	588
15:00	4	**413**	89	0	1	1	**6**	21	4	1	35	5	12	**592**
16:00	**12**	401	84	0	**2**	1	2	**36**	1	2	28	2	12	583
17:00	6	389	83	0	0	2	1	31	4	2	31	2	**17**	568
18:00	5	365	88	**1**	2	1	3	35	3	2	15	**10**	17	547
19:00	8	368	73	0	1	0	2	29	3	**5**	22	1	11	523
20:00	6	312	93	0	2	1	3	19	5	0	15	3	7	466
21:00	2	324	89	0	0	0	1	20	5	0	11	0	11	463
22:00	2	148	56	0	0	3	1	30	3	2	14	1	9	269
23:00	4	104	51	0	0	1	3	12	0	2	5	2	8	192
Day Total	110	5366	1412	2	23	20	27	399	47	23	319	39	159	7946
Percent	1.4%	67.5%	17.8%	0.0%	0.3%	0.3%	0.3%	5.0%	0.6%	0.3%	4.0%	0.5%	2.0%	
AM Peak	09:00	11:00	11:00	11:00	08:00	11:00	11:00	10:00	10:00	10:00	11:00	11:00	10:00	11:00
Vol.	11	343	112	1	3	3	2	26	3	3	35	7	8	545
PM Peak	16:00	15:00	14:00	18:00	16:00	13:00	15:00	16:00	13:00	19:00	12:00	18:00	17:00	15:00
Vol.	12	413	112	1	2	3	6	36	7	5	37	10	17	592

Ontario Traffic, Inc.
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Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	2	126	30	0	0	0	0	5	0	0	3	1	2	169
01:00	0	81	14	0	0	0	0	2	0	0	0	0	0	97
02:00	0	65	7	0	0	1	0	1	0	0	0	0	0	74
03:00	1	38	8	0	0	0	0	0	0	0	0	0	0	47
04:00	0	30	4	0	0	0	0	0	0	0	0	0	0	34
05:00	0	19	6	0	0	0	0	0	0	0	0	0	0	25
06:00	0	27	13	0	1	0	0	1	1	0	0	0	0	43
07:00	4	77	40	0	**3**	0	0	2	0	0	0	0	1	127
08:00	7	155	35	0	2	1	0	2	0	0	4	0	0	206
09:00	10	308	68	0	3	1	1	10	2	0	17	2	6	428
10:00	20	407	92	0	0	**2**	**4**	33	3	2	**41**	**7**	12	623
11:00	**21**	**459**	**94**	0	2	0	0	**50**	**6**	**4**	38	3	**21**	**698**
12 PM	**15**	**489**	98	0	1	3	**6**	**49**	6	**7**	**45**	9	24	**752**
13:00	13	463	**105**	1	**5**	3	4	39	2	5	43	9	30	722
14:00	8	445	90	**2**	3	0	2	39	4	2	25	3	16	639
15:00	12	444	92	0	0	1	0	40	0	1	26	2	10	628
16:00	13	400	74	0	1	2	2	30	3	2	40	3	17	587
17:00	12	362	68	0	2	0	2	25	**10**	5	26	2	11	525
18:00	8	324	56	0	3	**4**	2	41	7	4	23	**16**	**49**	537
19:00	6	300	51	0	1	2	5	24	1	2	15	2	20	429
20:00	1	283	57	0	1	1	1	9	0	0	10	0	5	368
21:00	4	251	51	0	1	0	1	9	0	0	10	0	3	330
22:00	4	180	39	0	0	1	0	3	2	1	4	0	2	236
23:00	1	90	21	0	0	0	0	4	0	0	1	0	0	117
Day Total	162	5823	1213	3	29	22	30	418	47	35	371	59	229	8441
Percent	1.9%	69.0%	14.4%	0.0%	0.3%	0.3%	0.4%	5.0%	0.6%	0.4%	4.4%	0.7%	2.7%	
AM Peak	11:00	11:00	11:00		07:00	10:00	10:00	11:00	11:00	11:00	10:00	10:00	11:00	11:00
Vol.	21	459	94		3	2	4	50	6	4	41	7	21	698
PM Peak	12:00	12:00	13:00	14:00	13:00	18:00	12:00	12:00	17:00	12:00	12:00	18:00	18:00	12:00
Vol.	15	489	105	2	5	4	6	49	10	7	45	16	49	752

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	3	53	11	0	0	0	0	2	0	0	0	0	0	69
01:00	2	44	9	0	0	0	0	0	0	0	0	0	0	55
02:00	1	43	5	0	0	0	1	0	0	0	0	0	0	50
03:00	0	32	3	0	0	1	0	0	0	0	0	0	0	36
04:00	0	19	4	0	0	2	0	0	0	0	0	0	0	25
05:00	0	16	4	0	0	0	0	0	0	0	0	0	0	20
06:00	0	28	8	0	2	1	0	0	1	0	0	0	0	40
07:00	2	69	17	0	2	1	0	1	2	0	2	0	0	96
08:00	1	137	43	0	3	1	0	3	1	0	3	0	0	192
09:00	3	238	59	0	**4**	2	1	14	1	0	16	0	7	345
10:00	**8**	**407**	64	**1**	4	2	1	**22**	**3**	0	**29**	1	10	552
11:00	7	404	**80**	1	1	**3**	**3**	20	3	**5**	18	**3**	**11**	**559**
12 PM	6	409	94	0	2	**3**	0	22	3	2	**37**	2	7	587
13:00	21	428	**101**	0	1	1	1	**38**	3	3	21	5	13	636
14:00	**22**	**444**	97	0	2	3	2	33	4	5	31	4	12	**659**
15:00	19	437	79	0	2	0	2	34	3	2	35	2	15	630
16:00	22	391	66	0	3	2	2	33	2	3	24	2	**25**	575
17:00	17	382	72	0	3	1	**3**	26	**8**	**8**	31	5	12	568
18:00	12	379	66	0	**4**	1	3	26	2	1	16	2	19	531
19:00	14	354	76	0	1	2	1	23	3	5	17	**6**	10	512
20:00	4	363	59	0	4	1	1	23	4	1	7	2	8	477
21:00	8	234	41	0	0	2	0	12	1	1	11	0	3	313
22:00	3	89	13	0	0	0	0	2	0	0	0	0	0	107
23:00	0	46	3	0	0	0	0	0	0	0	0	0	0	49
Day Total	175	5446	1074	2	38	29	21	334	44	36	298	34	152	7683
Percent	2.3%	70.9%	14.0%	0.0%	0.5%	0.4%	0.3%	4.3%	0.6%	0.5%	3.9%	0.4%	2.0%	
AM Peak	10:00	10:00	11:00	10:00	09:00	11:00	11:00	10:00	10:00	11:00	10:00	11:00	11:00	11:00
Vol.	8	407	80	1	4	3	3	22	3	5	29	3	11	559
PM Peak	14:00	14:00	13:00		18:00	12:00	17:00	13:00	17:00	17:00	12:00	19:00	16:00	14:00
Vol.	22	444	101		4	3	3	38	8	8	37	6	25	659
Grand Total	551	20815	4879	10	131	96	89	1354	173	110	1155	147	599	30109
Percent	1.8%	69.1%	16.2%	0.0%	0.4%	0.3%	0.3%	4.5%	0.6%	0.4%	3.8%	0.5%	2.0%	

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Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	0	1	5	7	2	0	0	0	0	0	0	0	15	46	50
01:00	0	0	0	6	4	0	0	0	0	0	0	0	0	10	41	42
02:00	0	0	0	2	4	0	0	0	0	0	0	0	0	6	42	43
03:00	0	0	0	3	4	0	0	0	0	0	0	0	0	7	42	43
04:00	0	0	1	3	3	0	0	0	0	0	0	0	0	7	41	42
05:00	0	0	0	4	4	0	0	0	0	0	0	0	0	8	42	43
06:00	0	0	2	5	9	0	0	0	0	0	0	0	0	16	46	47
07:00	0	0	0	16	21	0	0	0	0	0	0	0	0	37	46	48
08:00	0	0	0	20	29	0	0	0	0	0	0	0	0	49	47	48
09:00	0	0	9	58	36	1	**1**	0	0	0	0	0	0	105	45	48
10:00	0	0	**10**	97	63	**4**	0	**1**	**1**	0	0	0	**1**	**177**	46	49
11:00	0	0	4	**100**	**70**	1	0	0	0	0	0	0	1	176	46	48
12 PM	0	0	7	85	74	5	0	0	0	0	0	0	**1**	172	47	49
13:00	0	1	4	112	72	6	1	0	1	0	0	0	1	198	46	49
14:00	0	**2**	15	113	65	7	1	0	**2**	0	0	0	0	205	46	49
15:00	0	0	12	96	68	4	0	0	0	0	0	**1**	0	181	46	49
16:00	0	2	5	91	88	9	1	0	0	0	0	1	1	198	47	51
17:00	0	2	11	100	**95**	3	**2**	0	0	0	0	0	0	**213**	46	49
18:00	0	0	9	87	71	**10**	1	0	0	0	0	0	1	179	47	52
19:00	0	0	13	**121**	62	7	1	0	0	0	0	0	1	205	46	49
20:00	0	0	8	105	62	6	0	0	0	0	0	0	0	181	46	49
21:00	0	1	**19**	91	46	0	0	0	0	0	0	0	0	157	44	47
22:00	**1**	0	7	72	35	2	0	0	1	0	0	0	0	118	44	48
23:00	0	0	6	34	24	2	0	0	0	0	0	0	0	66	45	49
Total	1	8	143	1426	1016	69	8	1	5	0	0	2	7	2686		
Percent	0.0%	0.3%	5.3%	53.1%	37.8%	2.6%	0.3%	0.0%	0.2%	0.0%	0.0%	0.1%	0.3%			
AM Peak			10:00	11:00	11:00	10:00	09:00	10:00	10:00				10:00	10:00		
Vol.			10	100	70	4	1	1	1				1	177		
PM Peak	22:00	14:00	21:00	19:00	17:00	18:00	17:00		14:00			15:00	12:00	17:00		
Vol.	1	2	19	121	95	10	2		2			1	1	213		

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Main St north of River Rd W

Date Start: 30-Jun-17
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EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/01/17	0	0	3	22	22	**4**	0	0	0	0	0	0	0	51	47	50
01:00	0	0	1	17	14	2	0	0	0	0	0	0	0	34	46	49
02:00	0	0	2	15	10	1	0	0	0	0	0	0	0	28	46	49
03:00	0	0	0	13	12	0	0	0	0	0	0	0	0	25	45	48
04:00	0	0	2	5	9	2	0	0	0	0	0	0	0	18	47	50
05:00	0	0	0	7	6	2	0	0	0	0	0	0	0	15	45	50
06:00	0	1	2	13	7	2	0	0	0	0	0	0	0	25	44	50
07:00	0	0	2	28	22	2	0	0	0	0	0	0	0	54	46	49
08:00	0	0	3	40	33	1	0	0	0	0	0	0	0	77	46	48
09:00	0	0	3	83	58	4	0	0	0	0	0	0	0	148	46	49
10:00	0	0	4	112	**62**	1	0	0	0	0	0	0	0	179	45	48
11:00	0	**2**	**13**	**117**	59	2	**3**	0	0	0	0	0	**2**	**198**	45	49
12 PM	0	1	13	125	56	5	**3**	3	0	**2**	0	0	0	208	46	52
13:00	1	3	20	103	62	5	1	0	0	0	0	0	0	195	46	49
14:00	0	0	19	96	78	5	2	0	0	0	0	0	0	200	46	49
15:00	0	2	19	122	82	**8**	2	**4**	0	0	0	0	0	239	47	51
16:00	0	5	20	**149**	**86**	2	1	1	**1**	0	0	0	0	265	45	48
17:00	2	6	37	137	81	7	1	1	0	0	0	0	0	272	45	49
18:00	1	**7**	**40**	131	83	7	0	2	0	1	0	**1**	**1**	**274**	46	49
19:00	0	4	25	132	78	5	2	0	0	0	0	0	0	246	45	49
20:00	1	3	13	108	69	6	1	0	0	0	0	0	0	201	46	49
21:00	0	0	12	85	51	5	0	1	0	0	0	0	1	155	46	49
22:00	**7**	7	17	111	24	4	0	0	0	0	0	0	0	170	40	47
23:00	2	4	13	64	31	1	0	0	0	0	0	0	0	115	44	48
Total	14	45	283	1835	1095	83	16	12	1	3	0	1	4	3392		
Percent	0.4%	1.3%	8.3%	54.1%	32.3%	2.4%	0.5%	0.4%	0.0%	0.1%	0.0%	0.0%	0.1%			
AM Peak		11:00	11:00	11:00	10:00	00:00	11:00						11:00	11:00		
Vol.		2	13	117	62	4	3						2	198		
PM Peak	22:00	18:00	18:00	16:00	16:00	15:00	12:00	15:00	16:00	12:00		18:00	18:00	18:00		
Vol.	7	7	40	149	86	8	3	4	1	2		1	1	274		

Ontario Traffic, Inc.
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Newmarket, Ontario L3Y 3E3
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Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start	1	10	20	30	40	50	60	70	80	90	100	110	120		85th	95th
Time	9	19	29	39	49	59	69	79	89	99	109	119	9999	Total	Percent	Percent
07/02/17	0	1	3	58	40	4	0	0	0	0	0	0	0	106	46	49
01:00	0	0	2	29	27	3	0	0	0	0	0	0	0	61	46	49
02:00	1	0	1	20	25	2	0	0	0	0	0	0	0	49	47	49
03:00	0	1	4	9	15	1	1	0	0	0	0	0	0	31	46	49
04:00	0	0	1	5	10	0	0	0	0	0	0	0	0	16	47	48
05:00	0	1	0	3	8	0	0	0	0	0	0	0	0	12	45	46
06:00	0	0	2	12	13	2	0	0	0	0	0	0	0	29	47	50
07:00	0	0	4	31	16	2	0	0	0	0	0	0	0	53	44	48
08:00	0	0	4	51	34	3	1	0	0	0	**1**	0	0	94	46	49
09:00	0	0	12	114	53	**7**	2	**2**	0	0	0	0	0	190	46	50
10:00	**2**	**12**	27	**156**	**76**	2	**3**	0	0	0	0	0	**1**	**279**	44	48
11:00	2	4	**32**	121	75	2	2	1	0	0	0	0	1	240	45	49
12 PM	3	6	50	146	79	**8**	2	**3**	0	**1**	0	0	0	298	45	49
13:00	4	18	57	138	54	4	2	2	0	0	0	0	0	279	43	48
14:00	0	1	24	107	73	4	**4**	0	0	0	0	**1**	**2**	216	46	49
15:00	0	1	18	139	77	8	3	0	0	0	0	0	1	247	46	49
16:00	0	8	35	153	**98**	5	0	1	**1**	0	0	1	0	302	46	49
17:00	2	2	20	**175**	81	6	0	0	1	1	0	0	0	288	45	49
18:00	**27**	**63**	**104**	132	49	7	3	0	1	0	0	0	0	**386**	40	48
19:00	9	30	63	108	57	6	1	0	0	0	0	0	0	274	43	48
20:00	1	2	20	105	61	0	0	0	0	0	0	0	0	189	45	48
21:00	1	2	24	114	50	3	0	1	0	0	0	0	0	195	44	48
22:00	0	0	7	70	40	7	0	1	0	0	0	0	0	125	47	51
23:00	0	0	6	35	21	1	0	0	0	0	0	0	0	63	45	48
Total	52	152	520	2031	1132	87	24	11	3	2	1	2	5	4022		
Percent	1.3%	3.8%	12.9%	50.5%	28.1%	2.2%	0.6%	0.3%	0.1%	0.0%	0.0%	0.0%	0.1%			
AM Peak	10:00	10:00	11:00	10:00	10:00	09:00	10:00	09:00			08:00		10:00	10:00		
Vol.	2	12	32	156	76	7	3	2			1		1	279		
PM Peak	18:00	18:00	18:00	17:00	16:00	12:00	14:00	12:00	16:00	12:00		14:00	14:00	18:00		
Vol.	27	63	104	175	98	8	4	3	1	1		1	2	386		

Ontario Traffic, Inc.
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Site Code: 48
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Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	0	1	1	21	11	2	0	0	0	0	0	0	0	36	46	49
01:00	0	0	0	16	16	2	0	0	0	0	0	0	0	34	46	49
02:00	0	0	1	16	15	1	0	0	0	0	0	0	0	33	45	48
03:00	0	0	0	17	11	0	0	0	0	0	0	0	0	28	45	48
04:00	0	0	2	6	8	2	0	0	0	0	0	0	0	18	46	50
05:00	0	0	1	2	8	2	0	0	0	0	0	0	0	13	47	50
06:00	0	0	1	6	10	0	0	0	0	0	0	0	0	17	46	48
07:00	0	0	2	25	18	2	0	0	0	0	0	0	0	47	46	49
08:00	0	0	4	49	34	2	0	0	0	0	0	0	0	89	46	49
09:00	0	0	12	94	69	0	1	0	0	0	0	0	0	176	46	48
10:00	1	2	**19**	**152**	**70**	2	**2**	**2**	0	0	0	0	0	**250**	45	48
11:00	**3**	**3**	19	118	69	**4**	0	1	0	**1**	0	0	0	218	45	49
12 PM	1	0	16	117	66	9	2	0	0	0	0	0	1	212	46	50
13:00	0	3	15	110	75	8	1	0	0	0	0	0	**2**	214	46	49
14:00	1	4	25	128	78	2	**3**	**3**	1	**1**	**2**	0	0	248	46	49
15:00	0	3	28	110	**109**	3	3	0	**2**	0	1	0	0	259	47	49
16:00	1	4	29	159	93	8	2	0	1	0	0	0	1	298	46	49
17:00	**5**	5	40	179	85	**11**	1	1	2	0	0	0	2	331	45	49
18:00	5	**17**	**47**	**181**	87	6	1	0	0	0	1	0	0	**345**	44	48
19:00	3	6	46	179	94	5	1	0	0	0	1	0	0	335	45	48
20:00	0	7	36	171	77	7	0	0	0	0	0	0	0	298	44	48
21:00	0	2	33	118	57	8	0	0	0	0	0	0	0	218	45	49
22:00	0	0	4	37	19	9	1	0	0	0	0	0	0	70	48	55
23:00	0	0	1	14	10	1	0	0	0	0	0	0	0	26	46	49
Total	20	57	382	2025	1189	96	18	7	6	2	5	0	6	3813		
Percent	0.5%	1.5%	10.0%	53.1%	31.2%	2.5%	0.5%	0.2%	0.2%	0.1%	0.1%	0.0%	0.2%			
AM Peak	11:00	11:00	10:00	10:00	10:00	11:00	10:00	10:00		11:00				10:00		
Vol.	3	3	19	152	70	4	2	2		1				250		
PM Peak	17:00	18:00	18:00	18:00	15:00	17:00	14:00	14:00	15:00	14:00	14:00		13:00	18:00		
Vol.	5	17	47	181	109	11	3	3	2	1	2		2	345		
Grand Total	87	262	1328	7317	4432	335	66	31	15	7	6	5	22	13913		
Percent	0.6%	1.9%	9.5%	52.6%	31.9%	2.4%	0.5%	0.2%	0.1%	0.1%	0.0%	0.0%	0.2%			

	15th Percentile :	30 KPH
	50th Percentile :	37 KPH
	85th Percentile :	46 KPH
	95th Percentile :	49 KPH
Stats	10 KPH Pace Speed :	30-39 KPH
	Number in Pace :	7317
	Percent in Pace :	52.6%
	Number of Vehicles > 60 KPH :	145
	Percent of Vehicles > 60 KPH :	1.0%
	Mean Speed(Average) :	37 KPH

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Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	0	**1**	2	5	7	1	0	0	0	0	0	0	16	55	56
01:00	0	0	0	5	5	1	1	0	0	0	0	0	0	12	44	59
02:00	0	0	0	0	1	3	1	0	0	0	0	0	0	5	52	60
03:00	0	0	0	2	1	1	0	**1**	0	0	0	0	0	5	50	70
04:00	0	0	0	0	3	1	1	0	0	0	0	0	0	5	59	60
05:00	0	**1**	0	0	4	0	0	0	0	0	0	0	0	5	42	43
06:00	0	0	1	5	9	4	1	0	0	0	0	0	0	20	51	53
07:00	0	0	0	6	17	21	1	0	0	0	0	0	0	45	56	59
08:00	0	1	0	21	38	23	3	0	0	0	0	0	0	86	54	59
09:00	0	0	1	24	78	41	3	1	0	0	0	0	0	148	55	59
10:00	0	0	0	29	104	**42**	2	0	0	0	0	0	**2**	179	54	58
11:00	0	1	1	**32**	**153**	41	**4**	0	0	0	0	0	0	**232**	52	57
12 PM	0	0	1	37	156	50	2	0	0	0	0	0	0	246	52	57
13:00	0	**2**	3	**49**	166	45	**8**	1	**1**	0	0	0	**1**	276	52	59
14:00	0	1	0	40	**196**	51	5	1	0	0	0	0	0	**294**	52	58
15:00	0	0	2	34	162	**77**	8	0	1	0	0	0	0	284	55	59
16:00	0	0	0	25	146	56	2	0	0	0	0	0	0	229	53	58
17:00	0	0	1	15	118	66	5	0	0	0	0	**2**	0	207	55	59
18:00	0	1	2	22	146	60	7	0	0	0	0	0	1	239	55	59
19:00	0	0	2	37	158	48	3	1	1	0	0	0	0	250	52	57
20:00	0	0	0	32	141	50	5	0	0	0	**1**	0	0	229	54	58
21:00	0	1	1	37	87	22	4	0	0	0	0	0	0	152	50	57
22:00	0	1	2	28	65	21	0	1	0	**1**	0	0	0	119	51	57
23:00	0	0	**8**	13	33	12	1	**3**	0	0	0	0	0	70	52	59
Total	0	9	26	495	1992	743	68	9	3	1	1	2	4	3353		
Percent	0.0%	0.3%	0.8%	14.8%	59.4%	22.2%	2.0%	0.3%	0.1%	0.0%	0.0%	0.1%	0.1%			
AM Peak		05:00	00:00	11:00	11:00	10:00	11:00	03:00					10:00	11:00		
Vol.		1	1	32	153	42	4	1					2	232		
PM Peak		13:00	23:00	13:00	14:00	15:00	13:00	23:00	13:00	22:00	20:00	17:00	13:00	14:00		
Vol.		2	8	49	196	77	8	3	1	1	1	2	1	294		

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Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/01/17	0	0	0	8	16	12	2	0	0	0	0	0	0	38	55	59
01:00	0	**1**	0	5	13	8	1	0	0	0	0	0	0	28	54	57
02:00	0	0	0	5	12	7	2	0	0	0	0	0	0	26	54	60
03:00	0	0	0	3	18	2	0	0	0	0	0	0	0	23	48	50
04:00	0	0	0	7	5	5	1	**2**	0	0	0	0	0	20	54	70
05:00	0	0	0	2	7	1	0	0	0	0	0	0	0	10	45	46
06:00	0	1	1	6	17	7	3	0	0	0	0	0	0	35	54	60
07:00	0	1	1	10	33	23	4	0	0	0	0	0	0	72	56	59
08:00	0	0	**2**	14	84	27	3	0	0	0	0	0	0	130	53	57
09:00	0	0	2	30	111	**51**	**5**	2	**1**	0	0	0	0	202	55	59
10:00	0	1	0	29	180	35	5	0	1	**1**	0	0	**1**	253	51	58
11:00	0	0	2	**97**	**196**	49	2	0	0	0	0	**1**	0	**347**	49	56
12 PM	0	0	3	89	201	47	**7**	1	0	0	0	0	0	348	50	57
13:00	0	0	0	86	218	**57**	7	0	0	0	0	0	0	368	51	57
14:00	0	0	**4**	86	**240**	53	1	**3**	**1**	0	0	0	0	**388**	49	57
15:00	0	0	0	71	219	57	5	0	0	0	0	0	**1**	353	51	57
16:00	0	0	1	60	198	56	2	1	0	0	0	0	0	318	51	57
17:00	0	**1**	1	57	182	47	5	0	1	0	**1**	0	1	296	52	58
18:00	0	0	0	71	168	31	2	0	0	**1**	0	0	0	273	49	56
19:00	0	0	3	80	161	28	4	0	1	0	0	0	0	277	49	56
20:00	0	0	4	69	158	30	2	1	0	0	1	0	0	265	49	56
21:00	0	0	3	**109**	168	24	2	0	1	0	1	0	0	308	48	54
22:00	0	0	2	37	49	9	0	1	0	0	0	0	1	99	48	55
23:00	**1**	0	1	22	44	8	1	0	0	0	0	0	0	77	49	54
Total	1	5	30	1053	2698	674	66	11	6	2	3	1	4	4554		
Percent	0.0%	0.1%	0.7%	23.1%	59.2%	14.8%	1.4%	0.2%	0.1%	0.0%	0.1%	0.0%	0.1%			
AM Peak		01:00	08:00	11:00	11:00	09:00	09:00	04:00	09:00	10:00		11:00	10:00	11:00		
Vol.		1	2	97	196	51	5	2	1	1		1	1	347		
PM Peak	23:00	17:00	14:00	21:00	14:00	13:00	12:00	14:00	14:00	18:00	17:00		15:00	14:00		
Vol.	1	1	4	109	240	57	7	3	1	1	1		1	388		

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Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/02/17	**1**	0	0	15	36	11	0	0	0	0	0	0	0	63	50	56
01:00	0	0	1	11	22	1	0	1	0	0	0	0	0	36	48	49
02:00	1	1	**5**	4	10	2	2	0	0	0	0	0	0	25	49	60
03:00	0	0	1	2	10	2	1	0	0	0	0	0	0	16	50	51
04:00	0	0	0	7	9	2	0	0	0	0	0	0	0	18	47	50
05:00	0	0	0	2	9	2	0	0	0	0	0	0	0	13	48	50
06:00	0	0	0	4	4	4	2	0	0	0	0	0	0	14	53	60
07:00	0	1	1	11	34	27	0	0	0	0	0	0	0	74	55	57
08:00	0	0	3	17	65	25	2	0	0	0	0	0	0	112	53	57
09:00	0	**3**	4	38	146	43	3	1	0	0	0	0	0	238	52	57
10:00	0	2	4	68	220	45	3	1	**1**	0	0	0	0	344	49	56
11:00	1	0	3	**104**	**288**	**53**	**6**	**2**	1	0	0	0	0	**458**	49	57
12 PM	0	0	3	**123**	**266**	53	4	2	0	0	0	**3**	0	**454**	49	57
13:00	1	0	2	120	251	61	**6**	1	0	0	0	0	**1**	443	50	57
14:00	0	1	2	106	261	48	2	1	0	1	**1**	0	0	423	49	56
15:00	0	0	**8**	69	223	**74**	6	0	0	0	0	0	1	381	52	58
16:00	0	1	3	53	174	44	6	2	0	**2**	0	0	0	285	52	58
17:00	0	0	1	35	152	44	2	**3**	0	0	0	0	0	237	52	58
18:00	**2**	**3**	5	44	78	17	0	0	0	1	1	0	0	151	49	55
19:00	2	0	5	34	90	22	2	0	0	0	0	0	0	155	50	56
20:00	0	0	2	41	102	31	3	0	0	0	0	0	0	179	51	57
21:00	0	0	4	34	68	25	3	0	0	1	0	0	0	135	52	58
22:00	0	0	2	24	68	14	1	2	0	0	0	0	0	111	49	56
23:00	0	0	0	17	23	14	0	0	0	0	0	0	0	54	52	56
Total	8	12	59	983	2609	664	54	16	2	5	2	3	2	4419		
Percent	0.2%	0.3%	1.3%	22.2%	59.0%	15.0%	1.2%	0.4%	0.0%	0.1%	0.0%	0.1%	0.0%			
AM Peak	00:00	09:00	02:00	11:00	11:00	11:00	11:00	11:00	10:00					11:00		
Vol.	1	3	5	104	288	53	6	2	1					458		
PM Peak	18:00	18:00	15:00	12:00	12:00	15:00	13:00	17:00		16:00	14:00	12:00	13:00	12:00		
Vol.	2	3	8	123	266	74	6	3		2	1	3	1	454		

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17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	0	0	1	3	21	8	0	0	0	0	0	0	0	33	52	55
01:00	0	0	**2**	3	9	6	1	0	0	0	0	0	0	21	53	55
02:00	0	1	1	2	6	6	1	0	0	0	0	0	0	17	53	55
03:00	0	0	0	4	1	3	0	0	0	0	0	0	0	8	51	52
04:00	0	0	1	1	3	2	0	0	0	0	0	0	0	7	50	51
05:00	0	0	0	0	4	2	1	0	0	0	0	0	0	7	51	60
06:00	0	0	0	4	13	4	1	**1**	0	0	0	0	0	23	52	69
07:00	0	0	1	10	22	14	2	0	0	0	0	0	0	49	54	59
08:00	0	0	2	18	65	16	1	0	**1**	0	0	0	0	103	51	56
09:00	0	**2**	2	24	107	30	4	0	0	0	0	0	0	169	52	58
10:00	0	0	1	53	206	40	1	0	0	0	0	**1**	0	302	49	56
11:00	0	0	0	**62**	**214**	**56**	**5**	1	1	**1**	0	1	0	**341**	52	58
12 PM	0	0	**9**	**95**	214	54	3	0	0	0	0	0	0	375	50	56
13:00	0	0	2	84	262	66	5	1	0	**1**	0	0	1	**422**	51	57
14:00	0	0	3	55	**297**	50	5	1	0	0	0	0	0	411	49	56
15:00	0	0	0	60	226	**78**	4	0	**1**	0	0	0	**2**	371	53	58
16:00	**1**	0	2	46	166	49	6	**3**	1	1	0	0	2	277	53	59
17:00	1	0	0	50	137	37	**10**	1	1	0	0	0	0	237	53	59
18:00	0	0	1	24	118	37	5	1	0	0	0	0	0	186	53	58
19:00	0	0	1	35	110	27	3	0	1	0	0	0	0	177	51	57
20:00	0	0	1	34	97	39	4	2	0	0	0	**1**	1	179	54	59
21:00	0	0	0	28	55	12	0	0	0	0	0	0	0	95	49	54
22:00	0	0	0	7	20	8	2	0	0	0	0	0	0	37	53	57
23:00	0	0	0	6	8	6	3	0	0	0	0	0	0	23	55	61
Total	2	3	30	708	2381	650	67	11	6	3	0	3	6	3870		
Percent	0.1%	0.1%	0.8%	18.3%	61.5%	16.8%	1.7%	0.3%	0.2%	0.1%	0.0%	0.1%	0.2%			
AM Peak		09:00	01:00	11:00	11:00	11:00	11:00	06:00	08:00	11:00		10:00		11:00		
Vol.		2	2	62	214	56	5	1	1	1		1		341		
PM Peak	16:00		12:00	12:00	14:00	15:00	17:00	16:00	15:00	13:00		20:00	15:00	13:00		
Vol.	1		9	95	297	78	10	3	1	1		1	2	422		
Grand Total	11	29	145	3239	9680	2731	255	47	17	11	6	9	16	16196		
Percent	0.1%	0.2%	0.9%	20.0%	59.8%	16.9%	1.6%	0.3%	0.1%	0.1%	0.0%	0.1%	0.1%			

	15th Percentile :	36 KPH
	50th Percentile :	44 KPH
	85th Percentile :	52 KPH
	95th Percentile :	58 KPH
Stats	10 KPH Pace Speed :	40-49 KPH
	Number in Pace :	9680
	Percent in Pace :	59.8%
	Number of Vehicles > 60 KPH :	335
	Percent of Vehicles > 60 KPH :	2.1%
	Mean Speed(Average) :	45 KPH

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 48
Station ID: D47
Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	0	2	7	12	9	1	0	0	0	0	0	0	31	54	57
01:00	0	0	0	11	9	1	1	0	0	0	0	0	0	22	47	59
02:00	0	0	0	2	5	3	1	0	0	0	0	0	0	11	51	52
03:00	0	0	0	5	5	1	0	**1**	0	0	0	0	0	12	44	50
04:00	0	0	1	3	6	1	1	0	0	0	0	0	0	12	45	59
05:00	0	**1**	0	4	8	0	0	0	0	0	0	0	0	13	45	46
06:00	0	0	3	10	18	4	1	0	0	0	0	0	0	36	49	52
07:00	0	0	0	22	38	21	1	0	0	0	0	0	0	82	54	58
08:00	0	1	0	41	67	23	3	0	0	0	0	0	0	135	51	57
09:00	0	0	**10**	82	114	42	**4**	1	0	0	0	0	0	253	51	57
10:00	0	0	10	126	167	**46**	2	1	**1**	0	0	0	**3**	356	49	57
11:00	0	1	5	**132**	**223**	42	4	0	0	0	0	0	1	**408**	49	56
12 PM	0	0	8	122	230	55	2	0	0	0	0	0	1	418	49	56
13:00	0	**3**	7	**161**	238	51	**9**	1	**2**	0	0	0	**2**	474	49	57
14:00	0	3	15	153	**261**	58	6	1	2	0	0	0	0	**499**	49	56
15:00	0	0	14	130	230	**81**	8	0	1	0	0	1	0	465	52	58
16:00	0	2	5	116	234	65	3	0	0	0	0	1	1	427	50	57
17:00	0	2	12	115	213	69	7	0	0	0	0	**2**	0	420	52	58
18:00	0	1	11	109	217	70	8	0	0	0	0	0	2	418	52	58
19:00	0	0	15	158	220	55	4	1	1	0	0	0	1	455	49	56
20:00	0	0	8	137	203	56	5	0	0	0	**1**	0	0	410	49	56
21:00	0	2	**20**	128	133	22	4	0	0	0	0	0	0	309	48	54
22:00	**1**	1	9	100	100	23	0	1	1	**1**	0	0	0	237	48	55
23:00	0	0	14	47	57	14	1	**3**	0	0	0	0	0	136	49	56
Total	1	17	169	1921	3008	812	76	10	8	1	1	4	11	6039		
Percent	0.0%	0.3%	2.8%	31.8%	49.8%	13.4%	1.3%	0.2%	0.1%	0.0%	0.0%	0.1%	0.2%			
AM Peak		05:00	09:00	11:00	11:00	10:00	09:00	03:00	10:00				10:00	11:00		
Vol.		1	10	132	223	46	4	1	1				3	408		
PM Peak	22:00	13:00	21:00	13:00	14:00	15:00	13:00	23:00	13:00	22:00	20:00	17:00	13:00	14:00		
Vol.	1	3	20	161	261	81	9	3	2	1	1	2	2	499		

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Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/01/17	0	0	3	30	38	16	2	0	0	0	0	0	0	89	52	57
01:00	0	1	1	22	27	10	1	0	0	0	0	0	0	62	51	57
02:00	0	0	2	20	22	8	2	0	0	0	0	0	0	54	51	56
03:00	0	0	0	16	30	2	0	0	0	0	0	0	0	48	48	49
04:00	0	0	2	12	14	7	1	**2**	0	0	0	0	0	38	53	69
05:00	0	0	0	9	13	3	0	0	0	0	0	0	0	25	48	51
06:00	0	**2**	3	19	24	9	3	0	0	0	0	0	0	60	52	58
07:00	0	1	3	38	55	25	4	0	0	0	0	0	0	126	53	58
08:00	0	0	5	54	117	28	3	0	0	0	0	0	0	207	49	56
09:00	0	0	5	113	169	**55**	**5**	2	**1**	0	0	0	0	350	51	57
10:00	0	1	4	141	242	36	5	0	1	**1**	0	0	1	432	49	55
11:00	0	2	**15**	**214**	**255**	51	5	0	0	0	0	**1**	**2**	**545**	49	56
12 PM	0	1	16	**214**	257	52	**10**	**4**	0	**2**	0	0	0	556	49	57
13:00	1	3	20	189	280	62	8	0	0	0	0	0	0	563	49	56
14:00	0	0	23	182	**318**	58	3	3	**1**	0	0	0	0	588	49	55
15:00	0	2	19	193	301	**65**	7	4	0	0	0	0	**1**	**592**	49	56
16:00	0	5	21	209	284	58	3	2	1	0	0	0	0	583	49	55
17:00	2	**7**	38	194	263	54	6	1	1	0	**1**	0	1	568	49	56
18:00	1	7	**40**	202	251	38	2	2	0	2	0	**1**	1	547	48	54
19:00	0	4	28	212	239	33	6	0	1	0	0	0	0	523	48	53
20:00	1	3	17	177	227	36	3	1	0	0	1	0	0	466	48	54
21:00	0	0	15	194	219	29	2	1	1	0	1	0	1	463	48	53
22:00	**7**	7	19	148	73	13	0	1	0	0	0	0	1	269	46	50
23:00	3	4	14	86	75	9	1	0	0	0	0	0	0	192	47	49
Total	15	50	313	2888	3793	757	82	23	7	5	3	2	8	7946		
Percent	0.2%	0.6%	3.9%	36.3%	47.7%	9.5%	1.0%	0.3%	0.1%	0.1%	0.0%	0.0%	0.1%			
AM Peak		06:00	11:00	11:00	11:00	09:00	09:00	04:00	09:00	10:00		11:00	11:00	11:00		
Vol.		2	15	214	255	55	5	2	1	1		1	2	545		
PM Peak	22:00	17:00	18:00	12:00	14:00	15:00	12:00	12:00	14:00	12:00	17:00	18:00	15:00	15:00		
Vol.	7	7	40	214	318	65	10	4	1	2	1	1	1	592		

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Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/02/17	1	1	3	73	76	15	0	0	0	0	0	0	0	169	48	53
01:00	0	0	3	40	49	4	0	1	0	0	0	0	0	97	47	49
02:00	2	1	6	24	35	4	2	0	0	0	0	0	0	74	48	51
03:00	0	1	5	11	25	3	2	0	0	0	0	0	0	47	48	52
04:00	0	0	1	12	19	2	0	0	0	0	0	0	0	34	47	49
05:00	0	1	0	5	17	2	0	0	0	0	0	0	0	25	47	50
06:00	0	0	2	16	17	6	2	0	0	0	0	0	0	43	51	55
07:00	0	1	5	42	50	29	0	0	0	0	0	0	0	127	53	57
08:00	0	0	7	68	99	28	3	0	0	0	**1**	0	0	206	50	57
09:00	0	3	16	152	199	50	5	**3**	0	0	0	0	0	428	49	57
10:00	2	**14**	31	224	296	47	6	1	**1**	0	0	0	**1**	623	48	54
11:00	**3**	4	**35**	**225**	**363**	**55**	**8**	3	1	0	0	0	1	**698**	48	55
12 PM	3	6	53	**269**	**345**	61	6	**5**	0	1	0	**3**	0	**752**	48	56
13:00	5	18	59	258	305	65	8	3	0	0	0	0	1	722	48	55
14:00	0	2	26	213	334	52	6	1	0	1	**1**	1	**2**	639	49	55
15:00	0	1	26	208	300	**82**	**9**	0	0	0	0	0	2	628	49	57
16:00	0	9	38	206	272	49	6	3	**1**	**2**	0	1	0	587	49	56
17:00	2	2	21	210	233	50	2	3	1	1	0	0	0	525	49	56
18:00	**29**	**66**	**109**	176	127	24	3	0	1	1	1	0	0	537	45	50
19:00	11	30	68	142	147	28	3	0	0	0	0	0	0	429	47	53
20:00	1	2	22	146	163	31	3	0	0	0	0	0	0	368	48	54
21:00	1	2	28	148	118	28	3	1	0	1	0	0	0	330	48	55
22:00	0	0	9	94	108	21	1	3	0	0	0	0	0	236	48	55
23:00	0	0	6	52	44	15	0	0	0	0	0	0	0	117	49	54
Total	60	164	579	3014	3741	751	78	27	5	7	3	5	7	8441		
Percent	0.7%	1.9%	6.9%	35.7%	44.3%	8.9%	0.9%	0.3%	0.1%	0.1%	0.0%	0.1%	0.1%			
AM Peak	11:00	10:00	11:00	11:00	11:00	11:00	11:00	09:00	10:00		08:00		10:00	11:00		
Vol.	3	14	35	225	363	55	8	3	1		1		1	698		
PM Peak	18:00	18:00	18:00	12:00	12:00	15:00	15:00	12:00	16:00	16:00	14:00	12:00	14:00	12:00		
Vol.	29	66	109	269	345	82	9	5	1	2	1	3	2	752		

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Main St north of River Rd W

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	0	1	2	24	32	10	0	0	0	0	0	0	0	69	49	56
01:00	0	0	2	19	25	8	1	0	0	0	0	0	0	55	50	55
02:00	0	1	2	18	21	7	1	0	0	0	0	0	0	50	49	54
03:00	0	0	0	21	12	3	0	0	0	0	0	0	0	36	47	50
04:00	0	0	3	7	11	4	0	0	0	0	0	0	0	25	49	52
05:00	0	0	1	2	12	4	1	0	0	0	0	0	0	20	51	53
06:00	0	0	1	10	23	4	1	1	0	0	0	0	0	40	49	53
07:00	0	0	3	35	40	16	2	0	0	0	0	0	0	96	51	56
08:00	0	0	6	67	99	18	1	0	**1**	0	0	0	0	192	48	54
09:00	0	2	14	118	176	30	**5**	0	0	0	0	0	0	345	48	55
10:00	1	2	**20**	**205**	276	42	3	**2**	0	0	0	**1**	0	552	48	54
11:00	**3**	**3**	19	180	**283**	**60**	5	2	1	**2**	0	1	0	**559**	49	57
12 PM	1	0	25	212	280	63	5	0	0	0	0	0	1	587	49	56
13:00	0	3	17	194	337	74	6	1	0	**1**	0	0	**3**	636	49	56
14:00	1	4	28	183	**375**	52	8	**4**	1	1	**2**	0	0	**659**	49	56
15:00	0	3	28	170	335	**81**	7	0	**3**	0	1	0	2	630	49	57
16:00	2	4	31	205	259	57	8	3	2	1	0	0	3	575	49	57
17:00	**6**	5	40	**229**	222	48	**11**	2	3	0	0	0	2	568	49	57
18:00	5	**17**	**48**	205	205	43	6	1	0	0	1	0	0	531	48	55
19:00	3	6	47	214	204	32	4	0	1	0	1	0	0	512	48	53
20:00	0	7	37	205	174	46	4	2	0	0	0	**1**	1	477	48	55
21:00	0	2	33	146	112	20	0	0	0	0	0	0	0	313	47	51
22:00	0	0	4	44	39	17	3	0	0	0	0	0	0	107	51	57
23:00	0	0	1	20	18	7	3	0	0	0	0	0	0	49	52	60
Total	22	60	412	2733	3570	746	85	18	12	5	5	3	12	7683		
Percent	0.3%	0.8%	5.4%	35.6%	46.5%	9.7%	1.1%	0.2%	0.2%	0.1%	0.1%	0.0%	0.2%			
AM Peak	11:00	11:00	10:00	10:00	11:00	11:00	09:00	10:00	08:00	11:00		10:00		11:00		
Vol.	3	3	20	205	283	60	5	2	1	2		1		559		
PM Peak	17:00	18:00	18:00	17:00	14:00	15:00	17:00	14:00	15:00	13:00	14:00	20:00	13:00	14:00		
Vol.	6	17	48	229	375	81	11	4	3	1	2	1	3	659		
Grand Total	98	291	1473	10556	14112	3066	321	78	32	18	12	14	38	30109		
Percent	0.3%	1.0%	4.9%	35.1%	46.9%	10.2%	1.1%	0.3%	0.1%	0.1%	0.0%	0.0%	0.1%			

	15th Percentile :	32 KPH
	50th Percentile :	41 KPH
	85th Percentile :	49 KPH
	95th Percentile :	56 KPH
Stats	10 KPH Pace Speed :	40-49 KPH
	Number in Pace :	14112
	Percent in Pace :	46.9%
	Number of Vehicles > 60 KPH :	480
	Percent of Vehicles > 60 KPH :	1.6%
	Mean Speed(Average) :	41 KPH

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Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	**1**	0	0	0	0	1
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:00	**1**	**1**	**2**	0	0	0	0	0	0	0	0	0	0	**4**
08:00	0	0	2	0	0	0	0	0	0	0	0	0	**1**	3
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:00	0	0	0	0	0	0	0	**1**	0	0	0	0	0	1
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	**1**	0	0	0	0	0	**1**	0	0	0	0	0	0	2
14:00	1	**2**	0	0	0	0	0	0	0	0	0	0	0	3
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	1	0	0	0	0	0	0	**1**	0	0	**1**	0	0	3
17:00	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1
18:00	0	0	0	0	0	0	0	0	0	0	0	0	1	1
19:00	0	0	0	0	0	0	0	0	0	0	0	0	1	1
20:00	0	0	**1**	0	0	0	0	1	0	0	0	0	**3**	**5**
21:00	0	0	0	0	0	0	0	0	0	1	0	0	0	1
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	4	3	7	0	0	0	1	3	1	2	1	0	6	28
Percent	14.3%	10.7%	25.0%	0.0%	0.0%	0.0%	3.6%	10.7%	3.6%	7.1%	3.6%	0.0%	21.4%	
AM Peak	07:00	07:00	07:00					11:00	04:00				08:00	07:00
Vol.	1	1	2					1	1				1	4
PM Peak	13:00	14:00	20:00				13:00	16:00		17:00	16:00		20:00	20:00
Vol.	1	2	1				1	1		1	1		3	5

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	**2**	0	0	0	0	0	0	0	0	0	0	2
10:00	**2**	0	1	0	0	0	0	0	0	0	0	0	**1**	**4**
11:00	1	**1**	1	0	0	0	0	0	0	0	0	0	0	3
12 PM	1	0	0	0	0	0	0	0	0	0	**1**	0	0	2
13:00	1	0	1	0	0	0	0	0	0	**1**	0	0	1	4
14:00	**3**	1	**2**	**1**	0	**2**	**1**	1	0	0	0	0	1	12
15:00	0	0	0	0	0	1	0	1	**1**	1	1	**1**	2	8
16:00	0	**4**	0	1	0	1	0	1	0	0	0	0	1	8
17:00	1	1	2	0	0	0	0	**2**	0	1	0	0	0	7
18:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
19:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
20:00	1	1	0	0	0	0	0	0	0	0	0	0	0	2
21:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
22:00	2	1	0	0	0	0	0	1	0	0	0	0	4	8
23:00	2	0	0	0	0	0	0	1	0	0	1	1	**8**	**13**
Day Total	14	11	11	2	0	4	1	7	1	3	3	2	18	77
Percent	18.2%	14.3%	14.3%	2.6%	0.0%	5.2%	1.3%	9.1%	1.3%	3.9%	3.9%	2.6%	23.4%	
AM Peak	10:00	11:00	09:00										10:00	10:00
Vol.	2	1	2										1	4
PM Peak	14:00	16:00	14:00	14:00		14:00	14:00	17:00	15:00	13:00	12:00	15:00	23:00	23:00
Vol.	3	4	2	1		2	1	2	1	1	1	1	8	13

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Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	**1**	0	0	0	0	1
09:00	1	0	0	0	0	0	0	**1**	0	0	0	0	0	2
10:00	**2**	0	0	0	0	0	0	0	0	0	0	0	0	2
11:00	1	**3**	**2**	0	0	0	**1**	0	0	0	**1**	0	**1**	**9**
12 PM	0	0	0	0	0	**1**	0	1	0	0	1	**1**	**4**	8
13:00	**1**	1	1	0	0	0	0	0	0	0	**2**	0	2	7
14:00	0	0	1	0	0	0	0	**2**	0	0	1	0	3	7
15:00	1	0	**2**	0	0	0	0	2	0	**1**	0	0	3	**9**
16:00	1	1	2	0	0	0	0	0	0	1	0	0	0	5
17:00	0	0	2	0	0	0	0	0	0	1	1	0	0	4
18:00	0	**2**	0	0	0	0	0	1	0	1	0	0	4	8
19:00	0	0	0	0	0	0	0	0	0	0	0	0	1	1
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	7	8	10	0	0	1	1	7	1	4	6	1	18	64
Percent	10.9%	12.5%	15.6%	0.0%	0.0%	1.6%	1.6%	10.9%	1.6%	6.3%	9.4%	1.6%	28.1%	
AM Peak	10:00	11:00	11:00				11:00	09:00	08:00		11:00		11:00	11:00
Vol.	2	3	2				1	1	1		1		1	9
PM Peak	13:00	18:00	15:00			12:00		14:00		15:00	13:00	12:00	12:00	15:00
Vol.	1	2	2			1		2		1	2	1	4	9

Ontario Traffic, Inc.
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Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	**2**	0	0	0	0	0	0	0	0	0	0	2
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	**1**	1
11:00	**3**	**3**	2	0	0	0	0	0	0	0	**2**	0	0	**10**
12 PM	1	0	1	0	0	0	0	2	0	0	0	0	0	4
13:00	0	0	0	0	0	0	0	2	0	0	**1**	0	**3**	6
14:00	1	**2**	**3**	0	**1**	0	0	**7**	0	0	1	0	2	**17**
15:00	1	1	1	0	0	0	0	2	0	0	0	0	0	5
16:00	1	0	0	0	0	0	**1**	1	0	0	0	0	2	5
17:00	0	2	0	0	0	0	1	0	0	0	0	0	2	5
18:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
19:00	0	1	2	0	0	0	0	0	0	**1**	1	0	0	5
20:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
21:00	**2**	0	0	0	0	0	0	0	0	0	0	0	0	2
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	10	10	12	0	1	0	2	14	0	1	5	0	10	65
Percent	15.4%	15.4%	18.5%	0.0%	1.5%	0.0%	3.1%	21.5%	0.0%	1.5%	7.7%	0.0%	15.4%	
AM Peak	11:00	11:00	08:00								11:00		10:00	11:00
Vol.	3	3	2								2		1	10
PM Peak	21:00	14:00	14:00		14:00		16:00	14:00		19:00	13:00		13:00	14:00
Vol.	2	2	3		1		1	7		1	1		3	17
Grand Total	35	32	40	2	1	5	5	31	3	10	15	3	52	234
Percent	15.0%	13.7%	17.1%	0.9%	0.4%	2.1%	2.1%	13.2%	1.3%	4.3%	6.4%	1.3%	22.2%	

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Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	14	2	0	0	0	0	0	0	0	0	0	0	16
01:00	0	8	1	0	0	0	0	1	0	0	0	0	0	10
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	4	1	0	0	0	0	0	**1**	0	0	0	0	6
05:00	0	5	5	0	0	0	0	0	0	0	0	0	0	10
06:00	1	18	8	0	0	0	**1**	0	0	0	**1**	0	0	29
07:00	0	25	17	0	0	0	0	1	0	0	0	0	0	43
08:00	0	41	25	0	0	1	0	0	0	0	0	0	**2**	69
09:00	**2**	79	20	0	**1**	1	0	2	0	0	0	0	1	106
10:00	2	138	**35**	0	0	**2**	0	11	0	**1**	1	0	0	190
11:00	1	**177**	28	0	1	1	1	**14**	1	0	0	0	0	**224**
12 PM	2	176	43	0	0	0	2	17	0	1	0	1	1	243
13:00	10	198	**46**	**1**	**1**	**2**	**4**	26	1	3	2	3	1	298
14:00	**18**	**215**	39	0	0	1	1	23	0	3	1	**5**	6	312
15:00	13	189	44	0	0	0	2	18	1	3	3	1	2	276
16:00	16	180	43	0	0	0	0	26	1	2	4	1	5	278
17:00	13	161	34	1	0	0	3	24	0	2	1	3	7	249
18:00	16	175	35	0	0	0	3	22	0	3	**6**	2	2	264
19:00	13	211	39	0	0	0	1	31	**2**	**4**	4	5	**9**	**319**
20:00	13	197	31	0	1	0	2	**33**	0	1	4	5	7	294
21:00	5	136	36	0	0	2	0	31	1	2	3	2	7	225
22:00	2	151	22	0	0	0	1	14	0	0	0	0	1	191
23:00	2	92	20	0	0	0	1	6	0	0	0	0	0	121
Day Total	129	2595	574	2	4	10	22	300	8	25	30	28	51	3778
Percent	3.4%	68.7%	15.2%	0.1%	0.1%	0.3%	0.6%	7.9%	0.2%	0.7%	0.8%	0.7%	1.3%	
AM Peak	09:00	11:00	10:00		09:00	10:00	06:00	11:00	04:00	10:00	06:00		08:00	11:00
Vol.	2	177	35		1	2	1	14	1	1	1		2	224
PM Peak	14:00	14:00	13:00	13:00	13:00	13:00	13:00	20:00	19:00	19:00	18:00	14:00	19:00	19:00
Vol.	18	215	46	1	1	2	4	33	2	4	6	5	9	319

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Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	1	78	16	0	0	1	0	3	0	0	0	0	0	99
01:00	0	62	12	0	0	0	1	0	0	0	0	0	1	76
02:00	0	44	5	0	0	0	0	1	0	0	0	0	1	51
03:00	0	19	7	0	0	0	0	0	0	0	0	0	0	26
04:00	1	18	1	0	0	0	0	0	0	0	0	0	0	20
05:00	0	11	9	0	0	0	0	0	0	0	0	0	0	20
06:00	3	28	14	0	0	0	0	0	0	0	0	0	0	45
07:00	4	47	25	0	0	1	0	1	0	0	0	0	0	78
08:00	12	108	35	0	0	**2**	1	7	0	0	1	0	0	166
09:00	**16**	178	36	0	**1**	0	0	21	0	1	0	2	4	259
10:00	7	**193**	36	0	0	0	**4**	**40**	0	2	**8**	**4**	8	302
11:00	7	191	**40**	0	0	2	3	31	**1**	**9**	3	4	**20**	**311**
12 PM	4	193	**43**	0	0	0	**3**	**54**	2	**13**	4	5	12	**333**
13:00	6	154	42	0	0	1	1	46	1	7	3	8	23	292
14:00	7	151	25	0	**1**	2	3	41	**3**	7	6	**11**	**30**	287
15:00	6	181	35	0	1	2	2	43	0	7	7	7	25	316
16:00	7	173	37	**2**	0	0	3	33	2	9	4	7	23	300
17:00	**12**	157	27	0	0	1	1	42	1	7	5	8	21	282
18:00	11	195	26	1	1	1	2	35	2	6	**10**	10	24	324
19:00	10	**226**	35	0	0	1	0	26	1	1	6	4	8	318
20:00	8	189	39	0	0	0	2	29	2	5	1	1	6	282
21:00	5	150	37	0	0	**3**	1	33	0	0	2	2	11	244
22:00	3	53	14	2	1	0	0	13	0	2	2	5	12	107
23:00	5	77	19	0	1	1	0	12	0	3	3	2	12	135
Day Total	135	2876	615	5	6	18	27	511	15	79	65	80	241	4673
Percent	2.9%	61.5%	13.2%	0.1%	0.1%	0.4%	0.6%	10.9%	0.3%	1.7%	1.4%	1.7%	5.2%	
AM Peak	09:00	10:00	11:00		09:00	08:00	10:00	10:00	11:00	11:00	10:00	10:00	11:00	11:00
Vol.	16	193	40		1	2	4	40	1	9	8	4	20	311
PM Peak	17:00	19:00	12:00	16:00	14:00	21:00	12:00	12:00	14:00	12:00	18:00	14:00	14:00	12:00
Vol.	12	226	43	2	1	3	3	54	3	13	10	11	30	333

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Spruce St towards Beach Dr

Date Start: 30-Jun-17
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Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	0	110	19	0	0	0	**1**	6	0	0	0	0	0	136
01:00	0	60	5	0	1	0	0	1	0	0	0	0	0	67
02:00	0	39	8	0	0	0	0	0	0	0	0	0	1	48
03:00	0	17	6	0	0	0	0	0	0	0	0	0	0	23
04:00	1	9	4	0	0	1	0	0	0	0	0	0	0	15
05:00	1	10	4	0	0	0	0	0	0	0	1	0	0	16
06:00	0	26	10	0	0	0	0	0	0	0	0	0	0	36
07:00	2	53	25	0	**2**	0	0	3	0	0	0	0	0	85
08:00	7	92	22	0	1	0	1	6	0	0	0	1	0	130
09:00	**16**	149	31	0	0	0	0	6	1	1	1	1	2	208
10:00	15	214	33	0	0	1	0	23	**2**	**5**	3	2	5	303
11:00	16	**215**	**34**	0	1	**2**	1	**42**	2	4	**4**	**7**	**15**	**343**
12 PM	9	187	**44**	0	1	2	**9**	**50**	2	4	11	9	23	**351**
13:00	3	203	37	**1**	0	1	2	34	0	3	1	2	21	308
14:00	9	122	23	1	**2**	1	4	29	1	**9**	7	4	28	240
15:00	3	128	29	0	0	**3**	3	42	2	9	6	**11**	25	261
16:00	10	118	29	0	0	2	3	38	**6**	9	**12**	6	**31**	264
17:00	**16**	176	36	0	0	3	1	42	2	4	10	6	17	313
18:00	6	174	31	1	0	1	4	34	2	4	5	6	29	297
19:00	1	**222**	31	0	0	0	2	16	0	0	0	3	0	275
20:00	2	199	32	0	0	0	2	18	1	1	3	1	1	260
21:00	1	195	28	0	0	0	3	11	0	1	2	1	2	244
22:00	6	140	19	0	0	0	0	13	0	0	0	1	0	179
23:00	0	91	20	0	0	0	0	1	0	1	0	1	0	114
Day Total	124	2949	560	3	8	17	36	415	21	55	66	62	200	4516
Percent	2.7%	65.3%	12.4%	0.1%	0.2%	0.4%	0.8%	9.2%	0.5%	1.2%	1.5%	1.4%	4.4%	
AM Peak	09:00	11:00	11:00		07:00	11:00	00:00	11:00	10:00	10:00	11:00	11:00	11:00	11:00
Vol.	16	215	34		2	2	1	42	2	5	4	7	15	343
PM Peak	17:00	19:00	12:00	13:00	14:00	15:00	12:00	12:00	16:00	14:00	16:00	15:00	16:00	12:00
Vol.	16	222	44	1	2	3	9	50	6	9	12	11	31	351

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	1	41	5	0	0	0	0	2	0	0	0	0	0	49
01:00	1	36	6	0	**1**	0	0	0	0	0	0	0	0	44
02:00	0	18	4	0	0	0	0	0	0	0	0	0	0	22
03:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
04:00	0	4	2	0	0	1	0	0	0	0	0	0	0	7
05:00	0	11	3	0	0	1	0	0	0	0	0	0	0	15
06:00	0	13	7	0	1	1	0	1	0	0	0	0	0	23
07:00	5	47	19	0	0	1	0	0	1	0	0	0	0	73
08:00	2	93	29	0	0	**3**	0	6	0	0	0	0	0	133
09:00	2	122	29	0	1	0	0	11	0	1	**2**	0	0	168
10:00	**17**	194	37	0	0	0	**1**	16	0	1	1	**4**	1	272
11:00	14	**196**	**38**	0	0	0	1	**27**	**3**	**9**	2	2	**12**	**304**
12 PM	15	196	31	0	0	**5**	1	38	0	6	8	4	15	319
13:00	13	196	30	**1**	0	3	1	35	1	8	6	9	25	328
14:00	**22**	175	27	0	**1**	2	2	35	**2**	10	7	8	36	327
15:00	17	159	25	1	0	1	0	**46**	1	9	8	**12**	**43**	322
16:00	12	189	25	1	0	1	3	34	2	8	**9**	5	21	310
17:00	13	164	21	1	0	3	3	27	2	**12**	4	7	21	278
18:00	9	201	**43**	0	0	0	**4**	32	1	2	7	11	13	323
19:00	9	219	34	1	1	1	2	41	1	9	8	2	16	344
20:00	10	**241**	39	0	0	3	3	39	1	5	3	6	19	**369**
21:00	5	167	32	0	0	1	0	17	0	3	3	1	5	234
22:00	1	72	6	0	0	0	0	2	0	0	0	0	0	81
23:00	0	41	3	0	0	0	0	2	0	0	0	0	0	46
Day Total	168	2805	495	5	5	27	21	411	15	83	68	71	227	4401
Percent	3.8%	63.7%	11.2%	0.1%	0.1%	0.6%	0.5%	9.3%	0.3%	1.9%	1.5%	1.6%	5.2%	
AM Peak	10:00	11:00	11:00		01:00	08:00	10:00	11:00	11:00	11:00	09:00	10:00	11:00	11:00
Vol.	17	196	38		1	3	1	27	3	9	2	4	12	304
PM Peak	14:00	20:00	18:00	13:00	14:00	12:00	18:00	15:00	14:00	17:00	16:00	15:00	15:00	20:00
Vol.	22	241	43	1	1	5	4	46	2	12	9	12	43	369
Grand Total	556	11225	2244	15	23	72	106	1637	59	242	229	241	719	17368
Percent	3.2%	64.6%	12.9%	0.1%	0.1%	0.4%	0.6%	9.4%	0.3%	1.4%	1.3%	1.4%	4.1%	

Ontario Traffic, Inc.
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Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
06/30/17	0	14	2	0	0	0	0	0	0	0	0	0	0	16
01:00	0	8	1	0	0	0	0	1	0	0	0	0	0	10
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	4	1	0	0	0	0	0	**2**	0	0	0	0	7
05:00	0	5	5	0	0	0	0	0	0	0	0	0	0	10
06:00	1	18	9	0	0	0	**1**	0	0	0	**1**	0	0	30
07:00	1	26	19	0	0	0	0	1	0	0	0	0	0	47
08:00	0	41	27	0	0	1	0	0	0	0	0	0	**3**	72
09:00	**2**	79	20	0	**1**	1	0	2	0	0	0	0	1	106
10:00	2	138	**36**	0	0	**2**	0	11	0	**1**	1	0	0	191
11:00	1	**177**	28	0	1	1	1	**15**	1	0	0	0	0	**225**
12 PM	2	176	43	0	0	0	2	17	0	1	0	1	1	243
13:00	11	198	**46**	**1**	**1**	**2**	**5**	26	1	3	2	3	1	300
14:00	**19**	**217**	39	0	0	1	1	23	0	3	1	**5**	6	315
15:00	13	189	44	0	0	0	2	18	1	3	3	1	2	276
16:00	17	180	43	0	0	0	0	27	1	2	5	1	5	281
17:00	13	161	34	1	0	0	3	24	0	3	1	3	7	250
18:00	16	175	35	0	0	0	3	22	0	3	**6**	2	3	265
19:00	13	211	39	0	0	0	1	31	**2**	**4**	4	5	**10**	**320**
20:00	13	197	32	0	1	0	2	**34**	0	1	4	5	10	299
21:00	5	136	36	0	0	2	0	31	1	3	3	2	7	226
22:00	2	151	22	0	0	0	1	14	0	0	0	0	1	191
23:00	2	92	20	0	0	0	1	6	0	0	0	0	0	121
Day Total	133	2598	581	2	4	10	23	303	9	27	31	28	57	3806
Percent	3.5%	68.3%	15.3%	0.1%	0.1%	0.3%	0.6%	8.0%	0.2%	0.7%	0.8%	0.7%	1.5%	
AM Peak	09:00	11:00	10:00		09:00	10:00	06:00	11:00	04:00	10:00	06:00		08:00	11:00
Vol.	2	177	36		1	2	1	15	2	1	1		3	225
PM Peak	14:00	14:00	13:00	13:00	13:00	13:00	13:00	20:00	19:00	19:00	18:00	14:00	19:00	19:00
Vol.	19	217	46	1	1	2	5	34	2	4	6	5	10	320

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Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/01/17	1	78	16	0	0	1	0	3	0	0	0	0	0	99
01:00	0	62	12	0	0	0	1	0	0	0	0	0	1	76
02:00	0	44	6	0	0	0	0	1	0	0	0	0	1	52
03:00	0	19	7	0	0	0	0	0	0	0	0	0	0	26
04:00	1	18	1	0	0	0	0	0	0	0	0	0	0	20
05:00	0	11	9	0	0	0	0	0	0	0	0	0	0	20
06:00	3	28	14	0	0	0	0	0	0	0	0	0	0	45
07:00	4	47	25	0	0	1	0	1	0	0	0	0	0	78
08:00	12	108	35	0	0	**2**	1	7	0	0	1	0	0	166
09:00	**16**	178	38	0	**1**	0	0	21	0	1	0	2	4	261
10:00	9	**193**	37	0	0	0	**4**	**40**	0	2	**8**	**4**	9	306
11:00	8	192	**41**	0	0	2	3	31	**1**	**9**	3	4	**20**	**314**
12 PM	5	193	**43**	0	0	0	3	**54**	2	**13**	5	5	12	**335**
13:00	7	154	43	0	0	1	1	46	1	8	3	8	24	296
14:00	10	152	27	1	**1**	**4**	**4**	42	**3**	7	6	**11**	**31**	299
15:00	6	181	35	0	1	3	2	44	1	8	8	8	27	324
16:00	7	177	37	**3**	0	1	3	34	2	9	4	7	24	308
17:00	**13**	158	29	0	0	1	1	44	1	8	5	8	21	289
18:00	11	195	27	1	1	1	2	35	2	6	**10**	10	24	325
19:00	10	**227**	35	0	0	1	0	26	1	1	6	4	8	319
20:00	9	190	39	0	0	0	2	29	2	5	1	1	6	284
21:00	5	151	37	0	0	3	1	33	0	0	2	2	11	245
22:00	5	54	14	2	1	0	0	14	0	2	2	5	16	115
23:00	7	77	19	0	1	1	0	13	0	3	4	3	20	148
Day Total	149	2887	626	7	6	22	28	518	16	82	68	82	259	4750
Percent	3.1%	60.8%	13.2%	0.1%	0.1%	0.5%	0.6%	10.9%	0.3%	1.7%	1.4%	1.7%	5.5%	
AM Peak	09:00	10:00	11:00		09:00	08:00	10:00	10:00	11:00	11:00	10:00	10:00	11:00	11:00
Vol.	16	193	41		1	2	4	40	1	9	8	4	20	314
PM Peak	17:00	19:00	12:00	16:00	14:00	14:00	14:00	12:00	14:00	12:00	18:00	14:00	14:00	12:00
Vol.	13	227	43	3	1	4	4	54	3	13	10	11	31	335

Ontario Traffic, Inc.
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Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/02/17	0	111	19	0	0	0	1	6	0	0	0	0	0	137
01:00	0	60	5	0	1	0	0	1	0	0	0	0	0	67
02:00	0	39	8	0	0	0	0	0	0	0	0	0	1	48
03:00	0	17	6	0	0	0	0	0	0	0	0	0	0	23
04:00	1	9	4	0	0	1	0	0	0	0	0	0	0	15
05:00	1	10	4	0	0	0	0	0	0	0	1	0	0	16
06:00	0	26	10	0	0	0	0	0	0	0	0	0	0	36
07:00	2	53	25	0	**2**	0	0	3	0	0	0	0	0	85
08:00	7	92	22	0	1	0	1	6	1	0	0	1	0	131
09:00	**17**	149	31	0	0	0	0	7	1	1	1	1	2	210
10:00	17	214	33	0	0	1	0	23	**2**	**5**	3	2	5	305
11:00	17	**218**	**36**	0	1	**2**	**2**	**42**	2	4	**5**	**7**	**16**	**352**
12 PM	9	187	**44**	0	1	**3**	**9**	**51**	2	4	**12**	10	27	**359**
13:00	4	204	38	**1**	0	1	2	34	0	3	3	2	23	315
14:00	9	122	24	1	**2**	1	4	31	1	9	8	4	31	247
15:00	4	128	31	0	0	3	3	44	2	**10**	6	**11**	28	270
16:00	11	119	31	0	0	2	3	38	**6**	10	12	6	31	269
17:00	**16**	176	38	0	0	3	1	42	2	5	11	6	17	317
18:00	6	176	31	1	0	1	4	35	2	5	5	6	**33**	305
19:00	1	**222**	31	0	0	0	2	16	0	0	0	3	1	276
20:00	2	199	32	0	0	0	2	18	1	1	3	1	1	260
21:00	1	195	28	0	0	0	3	11	0	1	2	1	2	244
22:00	6	140	19	0	0	0	0	13	0	0	0	1	0	179
23:00	0	91	20	0	0	0	0	1	0	1	0	1	0	114
Day Total	131	2957	570	3	8	18	37	422	22	59	72	63	218	4580
Percent	2.9%	64.6%	12.4%	0.1%	0.2%	0.4%	0.8%	9.2%	0.5%	1.3%	1.6%	1.4%	4.8%	
AM Peak	09:00	11:00	11:00		07:00	11:00	11:00	11:00	10:00	10:00	11:00	11:00	11:00	11:00
Vol.	17	218	36		2	2	2	42	2	5	5	7	16	352
PM Peak	17:00	19:00	12:00	13:00	14:00	12:00	12:00	12:00	16:00	15:00	12:00	15:00	18:00	12:00
Vol.	16	222	44	1	2	3	9	51	6	10	12	11	33	359

Ontario Traffic, Inc.
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Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
07/03/17	1	41	5	0	0	0	0	2	0	0	0	0	0	49
01:00	1	36	6	0	**1**	0	0	0	0	0	0	0	0	44
02:00	0	18	4	0	0	0	0	0	0	0	0	0	0	22
03:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
04:00	0	4	2	0	0	1	0	0	0	0	0	0	0	7
05:00	0	11	3	0	0	1	0	0	0	0	0	0	0	15
06:00	0	13	7	0	1	1	0	1	0	0	0	0	0	23
07:00	5	47	19	0	0	1	0	0	1	0	0	0	0	73
08:00	2	93	31	0	0	**3**	0	6	0	0	0	0	0	135
09:00	2	122	29	0	1	0	0	11	0	1	2	0	0	168
10:00	**17**	194	37	0	0	0	**1**	16	0	1	1	**4**	2	273
11:00	17	**199**	**40**	0	0	0	1	**27**	**3**	**9**	**4**	2	**12**	**314**
12 PM	16	196	32	0	0	**5**	1	40	0	6	8	4	15	323
13:00	13	196	30	**1**	0	3	1	37	1	8	7	9	28	334
14:00	**23**	177	30	0	**2**	2	2	42	**2**	10	8	8	38	344
15:00	18	160	26	1	0	1	0	**48**	1	9	8	**12**	**43**	327
16:00	13	189	25	1	0	1	**4**	35	2	8	**9**	5	23	315
17:00	13	166	21	1	0	3	4	27	2	**12**	4	7	23	283
18:00	10	201	**43**	0	0	0	4	32	1	2	7	11	13	324
19:00	9	220	36	1	1	1	2	41	1	10	9	2	16	349
20:00	10	**242**	40	0	0	3	3	39	1	5	3	6	19	**371**
21:00	7	167	32	0	0	1	0	17	0	3	3	1	5	236
22:00	1	72	6	0	0	0	0	2	0	0	0	0	0	81
23:00	0	41	3	0	0	0	0	2	0	0	0	0	0	46
Day Total	178	2815	507	5	6	27	23	425	15	84	73	71	237	4466
Percent	4.0%	63.0%	11.4%	0.1%	0.1%	0.6%	0.5%	9.5%	0.3%	1.9%	1.6%	1.6%	5.3%	
AM Peak	10:00	11:00	11:00		01:00	08:00	10:00	11:00	11:00	11:00	11:00	10:00	11:00	11:00
Vol.	17	199	40		1	3	1	27	3	9	4	4	12	314
PM Peak	14:00	20:00	18:00	13:00	14:00	12:00	16:00	15:00	14:00	17:00	16:00	15:00	15:00	20:00
Vol.	23	242	43	1	2	5	4	48	2	12	9	12	43	371
Grand Total	591	11257	2284	17	24	77	111	1668	62	252	244	244	771	17602
Percent	3.4%	64.0%	13.0%	0.1%	0.1%	0.4%	0.6%	9.5%	0.4%	1.4%	1.4%	1.4%	4.4%	

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Spruce St towards Beach Dr

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EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	10	10
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	10	10
07:00	**2**	**2**	0	0	0	0	0	0	0	0	0	0	0	**4**	10	11
08:00	0	2	**1**	0	0	0	0	0	0	0	0	0	0	3	20	20
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	**1**	0	0	0	0	0	0	0	0	0	1	30	30
11:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	30	30
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13:00	0	**2**	0	0	0	0	0	0	0	0	0	0	0	2	11	11
14:00	0	2	0	0	**1**	0	0	0	0	0	0	0	0	3	40	40
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3	20	20
17:00	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
18:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
19:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	10	10
20:00	1	2	**2**	0	0	0	0	0	0	0	0	0	0	**5**	20	21
21:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	20
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	5	15	5	2	1	0	0	0	0	0	0	0	0	28		
Percent	17.9%	53.6%	17.9%	7.1%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	08:00	10:00										07:00		
Vol.	2	2	1	1										4		
PM Peak	17:00	13:00	20:00		14:00									20:00		
Vol.	1	2	2		1									5		

Ontario Traffic, Inc.
17705 Leslie St., Unit 6
Newmarket, Ontario L3Y 3E3
Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start	1	10	20	30	40	50	60	70	80	90	100	110	120		85th	95th
Time	9	19	29	39	49	59	69	79	89	99	109	119	9999	Total	Percent	Percent
07/01/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	20
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	2	40	40
10:00	**1**	**2**	0	0	1	0	0	0	0	0	0	0	0	**4**	11	40
11:00	0	1	**2**	0	0	0	0	0	0	0	0	0	0	3	21	21
12 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	2	11	11
13:00	1	1	1	1	0	0	0	0	0	0	0	0	0	4	29	30
14:00	2	**4**	**4**	0	**1**	0	0	0	0	**1**	0	0	0	12	23	40
15:00	2	3	2	0	1	0	0	0	0	0	0	0	0	8	21	40
16:00	1	2	2	**2**	1	0	0	0	0	0	0	0	0	8	31	40
17:00	0	4	1	2	0	0	0	0	0	0	0	0	0	7	30	31
18:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	20
19:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	20
20:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2	30	30
21:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	10	10
22:00	0	3	2	2	0	0	**1**	0	0	0	0	0	0	8	31	60
23:00	**7**	3	0	2	0	0	0	0	0	0	0	**1**	0	**13**	30	31
Total	14	27	17	11	5	0	1	0	0	1	0	1	0	77		
Percent	18.2%	35.1%	22.1%	14.3%	6.5%	0.0%	1.3%	0.0%	0.0%	1.3%	0.0%	1.3%	0.0%			
AM Peak	10:00	10:00	11:00	09:00	09:00									10:00		
Vol.	1	2	2	1	1									4		
PM Peak	23:00	14:00	14:00	16:00	14:00		22:00			14:00		23:00		23:00		
Vol.	7	4	4	2	1		1			1		1		13		

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Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/02/17	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	20
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
09:00	1	0	0	1	0	0	0	0	0	0	0	0	0	2	30	30
10:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2	20	20
11:00	1	**4**	**2**	**2**	0	0	0	0	0	0	0	0	0	**9**	30	31
12 PM	**3**	3	0	0	0	0	**1**	0	0	0	0	0	**1**	8	60	120
13:00	1	**5**	1	0	0	0	0	0	0	0	0	0	0	7	14	20
14:00	0	4	2	1	0	0	0	0	0	0	0	0	0	7	21	30
15:00	1	2	2	**3**	**1**	0	0	0	0	0	0	0	0	**9**	32	40
16:00	1	1	**3**	0	0	0	0	0	0	0	0	0	0	5	21	22
17:00	0	3	0	0	0	**1**	0	0	0	0	0	0	0	4	12	50
18:00	2	1	3	1	0	0	0	0	0	0	0	0	1	8	30	120
19:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	12	24	15	8	1	1	1	0	0	0	0	0	2	64		
Percent	18.8%	37.5%	23.4%	12.5%	1.6%	1.6%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%			
AM Peak	08:00	11:00	11:00	11:00										11:00		
Vol.	1	4	2	2										9		
PM Peak	12:00	13:00	16:00	15:00	15:00	17:00	12:00						12:00	15:00		
Vol.	3	5	3	3	1	1	1						1	9		

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Site Code: 49
Station ID: D8
Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	2	60	60
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	40	40
11:00	0	**5**	**2**	1	**2**	0	0	0	0	0	0	0	0	**10**	39	40
12 PM	0	1	**3**	0	0	0	0	0	0	0	0	0	0	4	21	22
13:00	2	4	0	0	0	0	0	0	0	0	0	0	0	6	12	13
14:00	1	**7**	3	**5**	0	0	**1**	0	0	0	0	0	0	**17**	32	34
15:00	0	1	2	1	**1**	0	0	0	0	0	0	0	0	5	39	40
16:00	2	2	0	1	0	0	0	0	0	0	0	0	0	5	11	30
17:00	**4**	1	0	0	0	0	0	0	0	0	0	0	0	5	4	10
18:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	10	10
19:00	0	1	2	1	1	0	0	0	0	0	0	0	0	5	39	40
20:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2	20	20
21:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2	20	20
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	9	25	14	10	5	0	2	0	0	0	0	0	0	65		
Percent	13.8%	38.5%	21.5%	15.4%	7.7%	0.0%	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		11:00	11:00	08:00	11:00		08:00							11:00		
Vol.		5	2	1	2		1							10		
PM Peak	17:00	14:00	12:00	14:00	15:00		14:00							14:00		
Vol.	4	7	3	5	1		1							17		
Grand Total	40	91	51	31	12	1	4	0	0	1	0	1	2	234		
Percent	17.1%	38.9%	21.8%	13.2%	5.1%	0.4%	1.7%	0.0%	0.0%	0.4%	0.0%	0.4%	0.9%			

	15th Percentile :	8 KPH
	50th Percentile :	18 KPH
	85th Percentile :	35 KPH
	95th Percentile :	46 KPH
Stats	10 KPH Pace Speed :	10-19 KPH
	Number in Pace :	91
	Percent in Pace :	38.9%
	Number of Vehicles > 50 KPH :	9
	Percent of Vehicles > 50 KPH :	3.8%
	Mean Speed(Average) :	23 KPH

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Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	1	10	5	0	0	0	0	0	0	0	0	0	16	32	33
01:00	0	1	7	2	0	0	0	0	0	0	0	0	0	10	26	30
02:00	0	0	1	1	**1**	0	0	0	0	0	0	0	0	3	40	40
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	2	21	21
04:00	0	1	5	0	0	0	0	0	0	0	0	0	0	6	23	24
05:00	0	2	8	0	0	0	0	0	0	0	0	0	0	10	25	26
06:00	3	5	17	4	0	0	0	0	0	0	0	0	0	29	29	32
07:00	1	16	22	4	0	0	0	0	0	0	0	0	0	43	28	31
08:00	2	33	32	2	0	0	0	0	0	0	0	0	0	69	27	29
09:00	**4**	53	43	6	0	0	0	0	0	0	0	0	0	106	27	30
10:00	2	58	124	6	0	0	0	0	0	0	0	0	0	190	28	29
11:00	1	**78**	**137**	**7**	1	0	0	0	0	0	0	0	0	**224**	27	29
12 PM	1	80	153	9	0	0	0	0	0	0	0	0	0	243	28	29
13:00	5	130	160	2	0	0	0	0	0	0	0	**1**	0	298	27	29
14:00	4	137	**164**	6	1	0	0	0	0	0	0	0	0	312	27	29
15:00	3	123	141	7	1	0	0	0	0	0	0	0	**1**	276	27	29
16:00	3	129	135	8	2	**1**	0	0	0	0	0	0	0	278	27	29
17:00	6	110	126	5	2	0	0	0	0	0	0	0	0	249	27	29
18:00	0	116	135	8	**4**	1	0	0	0	0	0	0	0	264	27	29
19:00	6	**190**	115	6	2	0	0	0	0	0	0	0	0	**319**	26	29
20:00	**16**	172	98	5	2	1	0	0	0	0	0	0	0	294	26	29
21:00	9	137	76	3	0	0	0	0	0	0	0	0	0	225	25	28
22:00	1	52	120	**18**	0	0	0	0	0	0	0	0	0	191	29	33
23:00	1	15	88	16	1	0	0	0	0	0	0	0	0	121	29	35
Total	68	1639	1919	130	17	3	0	0	0	0	0	1	1	3778		
Percent	1.8%	43.4%	50.8%	3.4%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	11:00	11:00	11:00	02:00									11:00		
Vol.	4	78	137	7	1									224		
PM Peak	20:00	19:00	14:00	22:00	18:00	16:00						13:00	15:00	19:00		
Vol.	16	190	164	18	4	1						1	1	319		

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Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/01/17	0	18	62	**19**	0	0	0	0	0	0	0	0	0	99	31	36
01:00	1	12	54	9	0	0	0	0	0	0	0	0	0	76	29	34
02:00	1	4	34	12	0	0	0	0	0	0	0	0	0	51	31	36
03:00	0	7	13	6	0	0	0	0	0	0	0	0	0	26	31	34
04:00	0	7	8	5	0	0	0	0	0	0	0	0	0	20	31	33
05:00	0	3	16	1	0	0	0	0	0	0	0	0	0	20	27	29
06:00	0	20	22	3	0	0	0	0	0	0	0	0	0	45	27	30
07:00	1	12	60	5	0	0	0	0	0	0	0	0	0	78	28	30
08:00	1	46	111	7	**1**	0	0	0	0	0	0	0	0	166	28	29
09:00	3	101	**149**	5	0	**1**	0	0	0	0	0	0	0	259	27	29
10:00	14	217	67	4	0	0	0	0	0	0	0	0	0	302	23	28
11:00	**17**	**241**	48	5	0	0	0	0	0	0	0	0	0	**311**	21	27
12 PM	42	**224**	65	2	0	0	0	0	0	0	0	0	0	**333**	22	27
13:00	38	201	49	3	1	0	0	0	0	0	0	0	0	292	21	27
14:00	**53**	194	36	3	0	0	0	**1**	0	0	0	0	0	287	19	26
15:00	34	218	57	5	1	0	0	1	0	0	0	0	0	316	22	28
16:00	34	215	46	5	0	0	0	0	0	0	0	0	0	300	21	27
17:00	31	205	39	5	**2**	0	0	0	0	0	0	0	0	282	20	27
18:00	33	218	69	4	0	0	0	0	0	0	0	0	0	324	23	28
19:00	4	161	**149**	3	1	0	0	0	0	0	0	0	0	318	26	29
20:00	10	153	117	0	2	0	0	0	0	0	0	0	0	282	26	28
21:00	19	167	55	3	0	0	0	0	0	0	0	0	0	244	23	28
22:00	19	67	19	2	0	0	0	0	0	0	0	0	0	107	22	27
23:00	16	55	56	**8**	0	0	0	0	0	0	0	0	0	135	27	30
Total	371	2766	1401	124	8	1	0	2	0	0	0	0	0	4673		
Percent	7.9%	59.2%	30.0%	2.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	09:00	00:00	08:00	09:00								11:00		
Vol.	17	241	149	19	1	1								311		
PM Peak	14:00	12:00	19:00	23:00	17:00			14:00						12:00		
Vol.	53	224	149	8	2			1						333		

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Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/02/17	0	30	84	**22**	0	0	0	0	0	0	0	0	0	136	30	36
01:00	0	11	43	13	0	0	0	0	0	0	0	0	0	67	31	36
02:00	0	7	32	9	0	0	0	0	0	0	0	0	0	48	31	36
03:00	1	0	17	5	0	0	0	0	0	0	0	0	0	23	31	33
04:00	0	6	8	1	0	0	0	0	0	0	0	0	0	15	26	27
05:00	1	5	9	1	0	0	0	0	0	0	0	0	0	16	27	28
06:00	1	12	22	1	0	0	0	0	0	0	0	0	0	36	27	29
07:00	1	25	57	2	0	0	0	0	0	0	0	0	0	85	27	29
08:00	1	45	77	7	0	0	0	0	0	0	0	0	0	130	28	29
09:00	1	65	132	9	0	**1**	0	0	0	0	0	0	0	208	28	29
10:00	3	146	**148**	6	0	0	0	0	0	0	0	0	0	303	27	29
11:00	**18**	**215**	99	11	0	0	0	0	0	0	0	0	0	**343**	25	29
12 PM	25	**245**	76	3	1	0	0	0	0	0	0	0	**1**	**351**	23	28
13:00	15	212	73	5	2	0	0	0	**1**	0	0	0	0	308	24	28
14:00	**62**	155	20	2	1	0	0	0	0	0	0	0	0	240	19	25
15:00	57	176	23	4	1	0	0	0	0	0	0	0	0	261	19	25
16:00	57	173	32	2	0	0	0	0	0	0	0	0	0	264	19	26
17:00	32	211	65	4	0	**1**	0	0	0	0	0	0	0	313	23	28
18:00	41	164	89	3	0	0	0	0	0	0	0	0	0	297	25	28
19:00	1	162	104	8	0	0	0	0	0	0	0	0	0	275	26	29
20:00	4	152	100	4	0	0	0	0	0	0	0	0	0	260	26	29
21:00	1	117	113	13	0	0	0	0	0	0	0	0	0	244	27	30
22:00	0	44	**115**	**17**	**3**	0	0	0	0	0	0	0	0	179	29	35
23:00	0	18	84	12	0	0	0	0	0	0	0	0	0	114	29	33
Total	322	2396	1622	164	8	2	0	0	1	0	0	0	1	4516		
Percent	7.1%	53.1%	35.9%	3.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	10:00	00:00		09:00								11:00		
Vol.	18	215	148	22		1								343		
PM Peak	14:00	12:00	22:00	22:00	22:00	17:00			13:00				12:00	12:00		
Vol.	62	245	115	17	3	1			1				1	351		

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Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	0	8	27	12	**1**	**1**	0	0	0	0	0	0	0	49	34	39
01:00	0	5	27	12	0	0	0	0	0	0	0	0	0	44	32	37
02:00	0	2	10	10	0	0	0	0	0	0	0	0	0	22	36	38
03:00	0	1	7	2	0	0	0	0	0	0	0	0	0	10	26	30
04:00	0	1	5	1	0	0	0	0	0	0	0	0	0	7	24	30
05:00	0	2	12	1	0	0	0	0	0	0	0	0	0	15	28	29
06:00	1	6	16	0	0	0	0	0	0	0	0	0	0	23	26	28
07:00	1	20	51	1	0	0	0	0	0	0	0	0	0	73	27	29
08:00	0	44	85	4	0	0	0	0	0	0	0	0	0	133	27	29
09:00	1	57	97	**13**	0	0	0	0	0	0	0	0	0	168	28	32
10:00	2	102	**160**	7	1	0	0	0	0	0	0	0	0	272	27	29
11:00	**9**	**184**	107	3	1	0	0	0	0	0	0	0	0	**304**	25	28
12 PM	21	216	80	1	1	0	0	0	0	0	0	0	0	319	24	28
13:00	38	213	76	1	0	0	0	0	0	0	0	0	0	328	23	27
14:00	40	**224**	50	10	**3**	0	0	0	0	0	0	0	0	327	22	29
15:00	**51**	220	46	3	2	0	0	0	0	0	0	0	0	322	20	27
16:00	17	213	75	3	1	0	0	0	0	0	0	**1**	0	310	24	28
17:00	28	180	68	2	0	0	0	0	0	0	0	0	0	278	23	27
18:00	11	170	131	10	1	0	0	0	0	0	0	0	0	323	27	29
19:00	8	186	**137**	12	1	0	0	0	0	0	0	0	0	344	26	29
20:00	21	221	122	5	0	0	0	0	0	0	0	0	0	**369**	25	28
21:00	6	114	105	8	1	0	0	0	0	0	0	0	0	234	27	29
22:00	0	10	52	**17**	2	0	0	0	0	0	0	0	0	81	33	37
23:00	0	5	26	13	1	**1**	0	0	0	0	0	0	0	46	34	39
Total	255	2404	1572	151	16	2	0	0	0	0	0	1	0	4401		
Percent	5.8%	54.6%	35.7%	3.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	10:00	09:00	00:00	00:00								11:00		
Vol.	9	184	160	13	1	1								304		
PM Peak	15:00	14:00	19:00	22:00	14:00	23:00						16:00		20:00		
Vol.	51	224	137	17	3	1						1		369		
Grand Total	1016	9205	6514	569	49	8	0	2	1	0	0	2	2	17368		
Percent	5.8%	53.0%	37.5%	3.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	11 KPH
	50th Percentile :	18 KPH
	85th Percentile :	26 KPH
	95th Percentile :	29 KPH
Stats	10 KPH Pace Speed :	10-19 KPH
	Number in Pace :	9205
	Percent in Pace :	53.0%
	Number of Vehicles > 50 KPH :	14
	Percent of Vehicles > 50 KPH :	0.1%
	Mean Speed(Average) :	18 KPH

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Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
06/30/17	0	1	10	5	0	0	0	0	0	0	0	0	0	16	32	33
01:00	0	1	7	2	0	0	0	0	0	0	0	0	0	10	26	30
02:00	0	0	1	1	**1**	0	0	0	0	0	0	0	0	3	40	40
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	2	21	21
04:00	0	2	5	0	0	0	0	0	0	0	0	0	0	7	23	24
05:00	0	2	8	0	0	0	0	0	0	0	0	0	0	10	25	26
06:00	3	6	17	4	0	0	0	0	0	0	0	0	0	30	28	31
07:00	3	18	22	4	0	0	0	0	0	0	0	0	0	47	28	31
08:00	2	35	33	2	0	0	0	0	0	0	0	0	0	72	26	29
09:00	**4**	53	43	6	0	0	0	0	0	0	0	0	0	106	27	30
10:00	2	58	124	7	0	0	0	0	0	0	0	0	0	191	28	29
11:00	1	**78**	**137**	**8**	1	0	0	0	0	0	0	0	0	**225**	28	29
12 PM	1	80	153	9	0	0	0	0	0	0	0	0	0	243	28	29
13:00	5	132	160	2	0	0	0	0	0	0	0	**1**	0	300	27	29
14:00	4	139	**164**	6	2	0	0	0	0	0	0	0	0	315	27	29
15:00	3	123	141	7	1	0	0	0	0	0	0	0	**1**	276	27	29
16:00	3	131	136	8	2	**1**	0	0	0	0	0	0	0	281	27	29
17:00	7	110	126	5	2	0	0	0	0	0	0	0	0	250	27	29
18:00	1	116	135	8	**4**	1	0	0	0	0	0	0	0	265	27	29
19:00	6	**191**	115	6	2	0	0	0	0	0	0	0	0	**320**	26	29
20:00	**17**	174	100	5	2	1	0	0	0	0	0	0	0	299	26	29
21:00	9	137	77	3	0	0	0	0	0	0	0	0	0	226	25	28
22:00	1	52	120	**18**	0	0	0	0	0	0	0	0	0	191	29	33
23:00	1	15	88	16	1	0	0	0	0	0	0	0	0	121	29	35
Total	73	1654	1924	132	18	3	0	0	0	0	0	1	1	3806		
Percent	1.9%	43.5%	50.6%	3.5%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	11:00	11:00	11:00	02:00									11:00		
Vol.	4	78	137	8	1									225		
PM Peak	20:00	19:00	14:00	22:00	18:00	16:00						13:00	15:00	19:00		
Vol.	17	191	164	18	4	1						1	1	320		

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Spruce St towards Beach Dr

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Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/01/17	0	18	62	**19**	0	0	0	0	0	0	0	0	0	99	31	36
01:00	1	12	54	9	0	0	0	0	0	0	0	0	0	76	29	34
02:00	1	4	35	12	0	0	0	0	0	0	0	0	0	52	31	36
03:00	0	7	13	6	0	0	0	0	0	0	0	0	0	26	31	34
04:00	0	7	8	5	0	0	0	0	0	0	0	0	0	20	31	33
05:00	0	3	16	1	0	0	0	0	0	0	0	0	0	20	27	29
06:00	0	20	22	3	0	0	0	0	0	0	0	0	0	45	27	30
07:00	1	12	60	5	0	0	0	0	0	0	0	0	0	78	28	30
08:00	1	46	111	7	**1**	0	0	0	0	0	0	0	0	166	28	29
09:00	3	101	**149**	6	1	**1**	0	0	0	0	0	0	0	261	27	29
10:00	15	219	67	4	1	0	0	0	0	0	0	0	0	306	23	28
11:00	**17**	**242**	50	5	0	0	0	0	0	0	0	0	0	**314**	21	27
12 PM	42	**226**	65	2	0	0	0	0	0	0	0	0	0	**335**	22	27
13:00	39	202	50	4	1	0	0	0	0	0	0	0	0	296	22	27
14:00	**55**	198	40	3	1	0	0	**1**	0	**1**	0	0	0	299	20	27
15:00	36	221	59	5	**2**	0	0	1	0	0	0	0	0	324	22	28
16:00	35	217	48	7	1	0	0	0	0	0	0	0	0	308	21	28
17:00	31	209	40	7	2	0	0	0	0	0	0	0	0	289	21	28
18:00	33	218	70	4	0	0	0	0	0	0	0	0	0	325	23	28
19:00	4	161	**150**	3	1	0	0	0	0	0	0	0	0	319	27	29
20:00	10	154	117	1	2	0	0	0	0	0	0	0	0	284	26	28
21:00	19	168	55	3	0	0	0	0	0	0	0	0	0	245	23	28
22:00	19	70	21	4	0	0	**1**	0	0	0	0	0	0	115	23	29
23:00	23	58	56	**10**	0	0	0	0	0	0	0	**1**	0	148	27	33
Total	385	2793	1418	135	13	1	1	2	0	1	0	1	0	4750		
Percent	8.1%	58.8%	29.9%	2.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	09:00	00:00	08:00	09:00								11:00		
Vol.	17	242	149	19	1	1								314		
PM Peak	14:00	12:00	19:00	23:00	15:00		22:00	14:00		14:00		23:00		12:00		
Vol.	55	226	150	10	2		1	1		1		1		335		

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Spruce St towards Beach Dr

Date Start: 30-Jun-17
Date End: 03-Jul-17
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/02/17	0	30	85	**22**	0	0	0	0	0	0	0	0	0	137	30	36
01:00	0	11	43	13	0	0	0	0	0	0	0	0	0	67	31	36
02:00	0	7	32	9	0	0	0	0	0	0	0	0	0	48	31	36
03:00	1	0	17	5	0	0	0	0	0	0	0	0	0	23	31	33
04:00	0	6	8	1	0	0	0	0	0	0	0	0	0	15	26	27
05:00	1	5	9	1	0	0	0	0	0	0	0	0	0	16	27	28
06:00	1	12	22	1	0	0	0	0	0	0	0	0	0	36	27	29
07:00	1	25	57	2	0	0	0	0	0	0	0	0	0	85	27	29
08:00	2	45	77	7	0	0	0	0	0	0	0	0	0	131	28	29
09:00	2	65	132	10	0	**1**	0	0	0	0	0	0	0	210	28	29
10:00	3	147	**149**	6	0	0	0	0	0	0	0	0	0	305	27	29
11:00	**19**	**219**	101	13	0	0	0	0	0	0	0	0	0	**352**	25	29
12 PM	28	**248**	76	3	1	0	**1**	0	0	0	0	0	**2**	**359**	23	28
13:00	16	217	74	5	2	0	0	0	**1**	0	0	0	0	315	24	28
14:00	**62**	159	22	3	1	0	0	0	0	0	0	0	0	247	19	25
15:00	58	178	25	7	2	0	0	0	0	0	0	0	0	270	19	27
16:00	58	174	35	2	0	0	0	0	0	0	0	0	0	269	19	26
17:00	32	214	65	4	0	**2**	0	0	0	0	0	0	0	317	23	28
18:00	43	165	92	4	0	0	0	0	0	0	0	0	1	305	25	28
19:00	2	162	104	8	0	0	0	0	0	0	0	0	0	276	26	29
20:00	4	152	100	4	0	0	0	0	0	0	0	0	0	260	26	29
21:00	1	117	113	13	0	0	0	0	0	0	0	0	0	244	27	30
22:00	0	44	**115**	**17**	**3**	0	0	0	0	0	0	0	0	179	29	35
23:00	0	18	84	12	0	0	0	0	0	0	0	0	0	114	29	33
Total	334	2420	1637	172	9	3	1	0	1	0	0	0	3	4580		
Percent	7.3%	52.8%	35.7%	3.8%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%			
AM Peak	11:00	11:00	10:00	00:00		09:00								11:00		
Vol.	19	219	149	22		1								352		
PM Peak	14:00	12:00	22:00	22:00	22:00	17:00	12:00		13:00				12:00	12:00		
Vol.	62	248	115	17	3	2	1		1				2	359		

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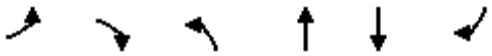
Date Start: 30-Jun-17

EB, WB

Start Time	1 9	10 19	20 29	30 39	40 49	50 59	60 69	70 79	80 89	90 99	100 109	110 119	120 9999	Total	85th Percent	95th Percent
07/03/17	0	8	27	12	1	**1**	0	0	0	0	0	0	0	49	34	39
01:00	0	5	27	12	0	0	0	0	0	0	0	0	0	44	32	37
02:00	0	2	10	10	0	0	0	0	0	0	0	0	0	22	36	38
03:00	0	1	7	2	0	0	0	0	0	0	0	0	0	10	26	30
04:00	0	1	5	1	0	0	0	0	0	0	0	0	0	7	24	30
05:00	0	2	12	1	0	0	0	0	0	0	0	0	0	15	28	29
06:00	1	6	16	0	0	0	0	0	0	0	0	0	0	23	26	28
07:00	1	20	51	1	0	0	0	0	0	0	0	0	0	73	27	29
08:00	0	44	85	5	0	0	**1**	0	0	0	0	0	0	135	28	29
09:00	1	57	97	**13**	0	0	0	0	0	0	0	0	0	168	28	32
10:00	2	102	**160**	7	2	0	0	0	0	0	0	0	0	273	27	29
11:00	**9**	**189**	109	4	**3**	0	0	0	0	0	0	0	0	**314**	26	29
12 PM	21	217	83	1	1	0	0	0	0	0	0	0	0	323	24	28
13:00	40	217	76	1	0	0	0	0	0	0	0	0	0	334	23	27
14:00	41	**231**	53	15	**3**	0	**1**	0	0	0	0	0	0	344	23	30
15:00	**51**	221	48	4	3	0	0	0	0	0	0	0	0	327	21	27
16:00	19	215	75	4	1	0	0	0	0	0	0	**1**	0	315	24	28
17:00	32	181	68	2	0	0	0	0	0	0	0	0	0	283	23	27
18:00	11	171	131	10	1	0	0	0	0	0	0	0	0	324	27	29
19:00	8	187	**139**	13	2	0	0	0	0	0	0	0	0	349	27	29
20:00	21	222	123	5	0	0	0	0	0	0	0	0	0	**371**	25	28
21:00	6	115	106	8	1	0	0	0	0	0	0	0	0	236	27	29
22:00	0	10	52	**17**	2	0	0	0	0	0	0	0	0	81	33	37
23:00	0	5	26	13	1	**1**	0	0	0	0	0	0	0	46	34	39
Total	264	2429	1586	161	21	2	2	0	0	0	0	1	0	4466		
Percent	5.9%	54.4%	35.5%	3.6%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	10:00	09:00	11:00	00:00	08:00							11:00		
Vol.	9	189	160	13	3	1	1							314		
PM Peak	15:00	14:00	19:00	22:00	14:00	23:00	14:00					16:00		20:00		
Vol.	51	231	139	17	3	1	1					1		371		
Grand Total	1056	9296	6565	600	61	9	4	2	1	1	0	3	4	17602		
Percent	6.0%	52.8%	37.3%	3.4%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	11 KPH
	50th Percentile :	18 KPH
	85th Percentile :	27 KPH
	95th Percentile :	29 KPH
Stats	10 KPH Pace Speed :	10-19 KPH
	Number in Pace :	9296
	Percent in Pace :	52.8%
	Number of Vehicles > 50 KPH :	23
	Percent of Vehicles > 50 KPH :	0.1%
	Mean Speed(Average) :	19 KPH

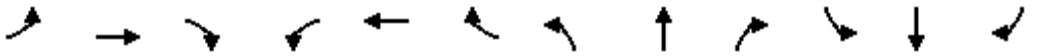
Appendix B:
Existing Traffic Operations



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	76	4	326	249	4
Future Volume (Veh/h)	32	76	4	326	249	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	83	4	354	271	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	635	273	275			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	635	273	275			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	89	100			
cM capacity (veh/h)	438	761	1277			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	118	358	275
Volume Left	35	4	0
Volume Right	83	0	4
cSH	624	1277	1700
Volume to Capacity	0.19	0.00	0.16
Queue Length 95th (m)	5.3	0.1	0.0
Control Delay (s)	12.1	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	12.1	0.1	0.0
Approach LOS	B		

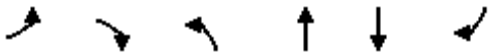
Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	0	26	0	0	0	14	344	0	0	231	55
Future Volume (Veh/h)	52	0	26	0	0	0	14	344	0	0	231	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	0	28	0	0	0	15	374	0	0	251	60
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	655	655	251	683	715	374	311			374		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	655	655	251	683	715	374	311			374		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	96	100	100	100	99			100		
cM capacity (veh/h)	373	378	783	345	349	668	1238			1174		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	85	0	389	251	60
Volume Left	57	0	15	0	0
Volume Right	28	0	0	0	60
cSH	451	1700	1238	1700	1700
Volume to Capacity	0.19	0.00	0.01	0.15	0.04
Queue Length 95th (m)	5.2	0.0	0.3	0.0	0.0
Control Delay (s)	14.8	0.0	0.4	0.0	0.0
Lane LOS	B	A	A		
Approach Delay (s)	14.8	0.0	0.4	0.0	
Approach LOS	B	A			

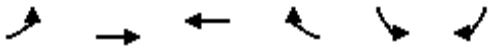
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	40.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	10	0	396	273	0
Future Volume (Veh/h)	35	10	0	396	273	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	11	0	430	297	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	727	148	297			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	727	148	297			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	99	100			
cM capacity (veh/h)	355	865	1247			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	38	11	430	148	148
Volume Left	38	0	0	0	0
Volume Right	0	11	0	0	0
cSH	355	865	1700	1700	1700
Volume to Capacity	0.11	0.01	0.25	0.09	0.09
Queue Length 95th (m)	2.7	0.3	0.0	0.0	0.0
Control Delay (s)	16.4	9.2	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	14.8		0.0	0.0	
Approach LOS	B				

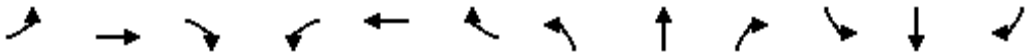
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	397	241	156	0	2
Future Volume (Veh/h)	62	397	241	156	0	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	432	262	170	0	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	432				913	216
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	432				913	216
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				100	100
cM capacity (veh/h)	1110				253	782

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	67	432	175	257	2
Volume Left	67	0	0	0	0
Volume Right	0	0	0	170	2
cSH	1110	1700	1700	1700	782
Volume to Capacity	0.06	0.25	0.10	0.15	0.00
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.1
Control Delay (s)	8.5	0.0	0.0	0.0	9.6
Lane LOS	A				A
Approach Delay (s)	1.1		0.0		9.6
Approach LOS					A

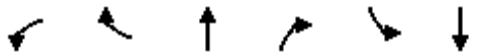
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	243	70	45	303	15	0	0	0	3	23	81
Future Volume (Veh/h)	95	243	70	45	303	15	0	0	0	3	23	81
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	264	76	49	329	16	0	0	0	3	25	88
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	345			340			871	951	302	943	981	172
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	345			340			871	951	302	943	981	172
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			96			100	100	100	98	88	89
cM capacity (veh/h)	1196			1202			179	223	688	194	214	835

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	443	214	180	116
Volume Left	103	49	0	3
Volume Right	76	0	16	88
cSH	1196	1202	1700	489
Volume to Capacity	0.09	0.04	0.11	0.24
Queue Length 95th (m)	2.1	1.0	0.0	7.0
Control Delay (s)	2.6	2.1	0.0	14.6
Lane LOS	A	A		B
Approach Delay (s)	2.6	1.2		14.6
Approach LOS				B

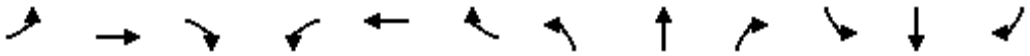
Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	25	123	1	7	120
Future Volume (Veh/h)	3	25	123	1	7	120
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	27	134	1	8	130
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	280	134			135	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	280	134			135	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	701	909			1437	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	30	135	138
Volume Left	3	0	8
Volume Right	27	1	0
cSH	883	1700	1437
Volume to Capacity	0.03	0.08	0.01
Queue Length 95th (m)	0.8	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

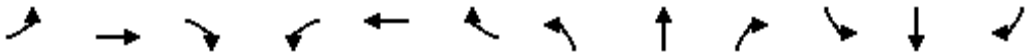
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	246	11	25	323	5	15	16	22	3	9	5
Future Volume (Veh/h)	7	246	11	25	323	5	15	16	22	3	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	267	12	27	351	5	16	17	24	3	10	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	356			279			528	699	140	590	702	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	356			279			528	699	140	590	702	178
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			96	95	97	99	97	99
cM capacity (veh/h)	1185			1266			408	348	877	355	347	828

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	142	146	202	180	57	18
Volume Left	8	0	27	0	16	3
Volume Right	0	12	0	5	24	5
cSH	1185	1700	1266	1700	494	415
Volume to Capacity	0.01	0.09	0.02	0.11	0.12	0.04
Queue Length 95th (m)	0.2	0.0	0.5	0.0	3.0	1.0
Control Delay (s)	0.5	0.0	1.2	0.0	13.2	14.1
Lane LOS	A		A		B	B
Approach Delay (s)	0.3		0.6		13.2	14.1
Approach LOS					B	B

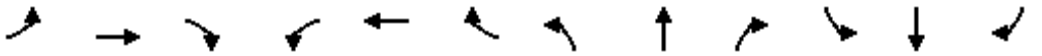
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	32.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	145	28	23	217	36	15	133	4	33	69	72
Future Volume (vph)	91	145	28	23	217	36	15	133	4	33	69	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	1.00		1.00	0.92	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3396			3427		1755	1840		1755	1706	
Flt Permitted		0.79			0.92		0.66	1.00		0.66	1.00	
Satd. Flow (perm)		2742			3183		1219	1840		1223	1706	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	158	30	25	236	39	16	145	4	36	75	78
RTOR Reduction (vph)	0	9	0	0	12	0	0	2	0	0	64	0
Lane Group Flow (vph)	0	278	0	0	288	0	16	147	0	36	89	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.9			26.9		7.4	7.4		7.4	7.4	
Effective Green, g (s)		26.9			26.9		7.4	7.4		7.4	7.4	
Actuated g/C Ratio		0.64			0.64		0.17	0.17		0.17	0.17	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1743			2024		213	321		213	298	
v/s Ratio Prot								c0.08			0.05	
v/s Ratio Perm		c0.10			0.09		0.01			0.03		
v/c Ratio		0.16			0.14		0.08	0.46		0.17	0.30	
Uniform Delay, d1		3.1			3.1		14.6	15.6		14.8	15.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.1		0.2	1.0		0.4	0.6	
Delay (s)		3.3			3.2		14.7	16.7		15.2	15.7	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		3.3			3.2			16.5			15.6	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	42.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	21	18	21	14	16	11	378	31	12	351	182
Future Volume (vph)	171	21	18	21	14	16	11	378	31	12	351	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.93		1.00	0.92			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)	1755	1718		1755	1700			3466			3504	1570
Flt Permitted	0.60	1.00		0.73	1.00			0.94			0.94	1.00
Satd. Flow (perm)	1115	1718		1347	1700			3269			3286	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	23	20	23	15	17	12	411	34	13	382	198
RTOR Reduction (vph)	0	10	0	0	11	0	0	10	0	0	0	130
Lane Group Flow (vph)	186	33	0	23	21	0	0	447	0	0	395	68
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	30.5	30.5		20.5	20.5			20.5			20.5	20.5
Effective Green, g (s)	30.5	30.5		20.5	20.5			20.5			20.5	20.5
Actuated g/C Ratio	0.51	0.51		0.34	0.34			0.34			0.34	0.34
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	625	873		460	580			1116			1122	536
v/s Ratio Prot	c0.03	0.02			0.01							
v/s Ratio Perm	c0.12			0.02				c0.14			0.12	0.04
v/c Ratio	0.30	0.04		0.05	0.04			0.40			0.35	0.13
Uniform Delay, d1	8.3	7.4		13.2	13.2			15.1			14.8	13.6
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.1		0.2	0.1			1.1			0.9	0.5
Delay (s)	8.6	7.5		13.4	13.3			16.1			15.6	14.1
Level of Service	A	A		B	B			B			B	B
Approach Delay (s)		8.4			13.3			16.1			15.1	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	99	5	424	187	4
Future Volume (Veh/h)	42	99	5	424	187	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	108	5	461	203	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	676	205	207			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	676	205	207			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	87	100			
cM capacity (veh/h)	414	831	1352			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	154	466	207
Volume Left	46	5	0
Volume Right	108	0	4
cSH	639	1352	1700
Volume to Capacity	0.24	0.00	0.12
Queue Length 95th (m)	7.1	0.1	0.0
Control Delay (s)	12.4	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	12.4	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	0	34	0	0	0	18	447	0	0	157	61
Future Volume (Veh/h)	68	0	34	0	0	0	18	447	0	0	157	61
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	0	37	0	0	0	20	486	0	0	171	66
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	697	697	171	734	763	486	237			486		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	697	697	171	734	763	486	237			486		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	100	96	100	100	100	98			100		
cM capacity (veh/h)	349	357	868	315	327	577	1318			1067		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	111	0	506	171	66
Volume Left	74	0	20	0	0
Volume Right	37	0	0	0	66
cSH	436	1700	1318	1700	1700
Volume to Capacity	0.25	0.00	0.02	0.10	0.04
Queue Length 95th (m)	7.6	0.0	0.4	0.0	0.0
Control Delay (s)	16.1	0.0	0.5	0.0	0.0
Lane LOS	C	A	A		
Approach Delay (s)	16.1	0.0	0.5	0.0	
Approach LOS	C	A			

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	13	0	515	205	0
Future Volume (Veh/h)	46	13	0	515	205	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	14	0	560	223	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	783	112	223			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	783	112	223			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	98	100			
cM capacity (veh/h)	327	914	1329			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	50	14	560	112	112
Volume Left	50	0	0	0	0
Volume Right	0	14	0	0	0
cSH	327	914	1700	1700	1700
Volume to Capacity	0.15	0.02	0.33	0.07	0.07
Queue Length 95th (m)	4.1	0.4	0.0	0.0	0.0
Control Delay (s)	18.0	9.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	16.0		0.0	0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	95	530	181	241	0	0
Future Volume (Veh/h)	95	530	181	241	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	576	197	262	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	459				1110	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	459				1110	230
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				100	100
cM capacity (veh/h)	1084				181	767

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	103	576	131	328	0
Volume Left	103	0	0	0	0
Volume Right	0	0	0	262	0
cSH	1084	1700	1700	1700	1700
Volume to Capacity	0.09	0.34	0.08	0.19	0.00
Queue Length 95th (m)	2.4	0.0	0.0	0.0	0.0
Control Delay (s)	8.7	0.0	0.0	0.0	0.0
Lane LOS	A				A
Approach Delay (s)	1.3		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	349	77	50	319	17	0	0	0	3	26	103
Future Volume (Veh/h)	104	349	77	50	319	17	0	0	0	3	26	103
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	113	379	84	54	347	18	0	0	0	3	28	112
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	365			463			1054	1120	421	1111	1153	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	365			463			1054	1120	421	1111	1153	182
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			95			100	100	100	98	83	86
cM capacity (veh/h)	1176			1081			119	174	576	144	166	822

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	576	228	192	143
Volume Left	113	54	0	3
Volume Right	84	0	18	112
cSH	1176	1081	1700	439
Volume to Capacity	0.10	0.05	0.11	0.33
Queue Length 95th (m)	2.4	1.2	0.0	10.6
Control Delay (s)	2.5	2.4	0.0	17.1
Lane LOS	A	A		C
Approach Delay (s)	2.5	1.3		17.1
Approach LOS				C

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	28	120	1	8	129
Future Volume (Veh/h)	3	28	120	1	8	129
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	30	130	1	9	140
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	288	130			131	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	288	130			131	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	693	914			1442	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	33	131	149
Volume Left	3	0	9
Volume Right	30	1	0
cSH	888	1700	1442
Volume to Capacity	0.04	0.08	0.01
Queue Length 95th (m)	0.9	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	333	12	28	388	6	17	18	24	3	10	6
Future Volume (Veh/h)	8	333	12	28	388	6	17	18	24	3	10	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	362	13	30	422	7	18	20	26	3	11	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	429			375			670	876	188	720	878	214
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	429			375			670	876	188	720	878	214
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			94	93	97	99	96	99
cM capacity (veh/h)	1113			1166			317	273	816	277	272	784

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	190	194	241	218	64	21
Volume Left	9	0	30	0	18	3
Volume Right	0	13	0	7	26	7
cSH	1113	1700	1166	1700	395	349
Volume to Capacity	0.01	0.11	0.03	0.13	0.16	0.06
Queue Length 95th (m)	0.2	0.0	0.6	0.0	4.3	1.5
Control Delay (s)	0.5	0.0	1.2	0.0	15.9	16.0
Lane LOS	A		A		C	C
Approach Delay (s)	0.2		0.6		15.9	16.0
Approach LOS					C	C

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	37.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	229	31	26	326	40	17	147	4	37	76	79
Future Volume (vph)	100	229	31	26	326	40	17	147	4	37	76	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.98		1.00	1.00		1.00	0.92	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3417			3445		1755	1840		1755	1706	
Flt Permitted		0.78			0.92		0.65	1.00		0.65	1.00	
Satd. Flow (perm)		2693			3191		1201	1840		1207	1706	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	249	34	28	354	43	18	160	4	40	83	86
RTOR Reduction (vph)	0	7	0	0	9	0	0	2	0	0	71	0
Lane Group Flow (vph)	0	385	0	0	416	0	18	162	0	40	98	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		29.0			29.0		7.8	7.8		7.8	7.8	
Effective Green, g (s)		29.0			29.0		7.8	7.8		7.8	7.8	
Actuated g/C Ratio		0.65			0.65		0.17	0.17		0.17	0.17	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1743			2065		209	320		210	297	
v/s Ratio Prot								c0.09			0.06	
v/s Ratio Perm		c0.14			0.13		0.01			0.03		
v/c Ratio		0.22			0.20		0.09	0.50		0.19	0.33	
Uniform Delay, d1		3.3			3.2		15.5	16.8		15.8	16.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2		0.2	1.3		0.4	0.7	
Delay (s)		3.5			3.4		15.7	18.0		16.2	16.9	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		3.5			3.4			17.8			16.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	44.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	25	22	23	23	18	18	416	34	13	387	291
Future Volume (vph)	205	25	22	23	23	18	18	416	34	13	387	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.93		1.00	0.93			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)	1755	1717		1755	1724			3465			3504	1570
Flt Permitted	0.60	1.00		0.72	1.00			0.93			0.93	1.00
Satd. Flow (perm)	1102	1717		1337	1724			3229			3279	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	27	24	25	25	20	20	452	37	14	421	316
RTOR Reduction (vph)	0	12	0	0	13	0	0	10	0	0	0	208
Lane Group Flow (vph)	223	39	0	25	32	0	0	499	0	0	435	108
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	30.5	30.5		20.5	20.5			20.5			20.5	20.5
Effective Green, g (s)	30.5	30.5		20.5	20.5			20.5			20.5	20.5
Actuated g/C Ratio	0.51	0.51		0.34	0.34			0.34			0.34	0.34
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	620	872		456	589			1103			1120	536
v/s Ratio Prot	c0.03	0.02			0.02							
v/s Ratio Perm	c0.15			0.02				c0.15			0.13	0.07
v/c Ratio	0.36	0.04		0.05	0.05			0.45			0.39	0.20
Uniform Delay, d1	8.5	7.4		13.3	13.2			15.4			15.0	14.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.4	0.1		0.2	0.2			1.3			1.0	0.8
Delay (s)	8.9	7.5		13.5	13.4			16.7			16.0	14.8
Level of Service	A	A		B	B			B			B	B
Approach Delay (s)		8.6			13.4			16.7			15.5	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Appendix C:
Future Development

THE TOWN OF WASAGA BEACH

DOWNTOWN DEVELOPMENT MASTER PLAN

FINAL REPORT
MARCH 2017

DEVELOPMENT PROGRAM

C.1 DEVELOPMENT PARCELS

In order to quantify the development described by the DDMP, the team defined development 'parcels'. The shape and size of the parcels respond to existing property lines, existing and proposed streets, and the anticipated land uses and building format. These parcels do not necessarily represent the future/finalized development parcels (this will be determined through further detailed design and by market forces) but are useful in estimating and testing the development potential of the plan.

C.2 PARCEL CALCULATION ASSUMPTIONS CHART

* Note: Civic Buildings Not Included in Calculations

DOWNTOWN

		BLOCK								RETAIL				RESIDENTIAL AREA						
										% Of Ground Floor Footprint										
PROJECT TYPE	PLOT TYPE	BLOCK	BLOCK SIZE (sq.m)	HECTARES	E COVERAGE ASSUMPTI	BULIDING (S) FOOTPRINT (sq.m)	HEIGHT (# Floors inc. GROUND)	GFA (sq.m)	FAR	% RETAIL	RETAIL GFA (sq.m)	PARKING UNITS / sq.m	PARKING REQ.	GFA LEFT	RESIDENTIAL AREA (sq.m)	AVG UNIT SIZE (sq.m)	Gross Efficiency (%)	# UNITS	PARKING UNITS / UNIT	PARKING REQ.	GFA LEFT
Catalyst Project	Mixed Use - Civic / Ret. / Res.	A1	8,230	0.82	30%	2,469	4	9,876	1.20	150%	3,704	0.043	159	6,173	6,173	90	20%	55	1.25	44	0
Catalyst Project	Mixed Use - Ret. / Res.	A2	7,428	0.74	30%	2,228	4	8,914	1.20	90%	2,006	0.043	86	6,908	6,908	90	20%	61	1.25	49	0
Catalyst Project	Mixed Use - Ret. / Res.	A3	8,244	0.82	30%	2,473	4	9,893	1.20	90%	2,226	0.043	96	7,667	7,667	90	20%	68	1.25	55	0
Catalyst Project	Mixed Use - Ret. / Res.	A4	4,622	0.46	30%	1,387	4	5,546	1.20	90%	1,248	0.043	54	4,298	4,298	90	20%	38	1.25	31	0
																90					
Resultant Development	Civic (Possible Sports Hub Site)	A5	25,439	2.54		0		0	0.00		0	0.043	0	0	0	90	20%	0	1.25	0	0
Resultant Development	Mixed Use - Ret. / Res.	A6	9,733	0.97	30%	2,920	6	17,519	1.80	90%	2,628	0.043	113	14,891	14,891	90	20%	132	1.25	106	0
Resultant Development	Mixed Use - Ret. / Res.	A7	6,500	0.65	30%	1,950	4	7,800	1.20	90%	1,755	0.043	75	6,045	6,045	90	20%	54	1.25	43	0
Resultant Development	Mixed Use - Ret. / Res.	A8	4,577	0.46	30%	1,373	4	5,492	1.20	0%	0	0.043	0	5,492	5,492	90	20%	49	1.25	39	0
Resultant Development	Mixed Use - Ret. / Res.	A9	1,265	0.13	30%	380	4	1,518	1.20	90%	342	0.043	15	1,176	1,176	90	20%	10	1.25	8	0
Resultant Development	Mixed Use - Ret. / Res.	A10	5,935	0.59	30%	1,781	4	7,122	1.20	0%	0	0.043	0	7,122	7,122	90	20%	63	1.25	51	0
Resultant Development	Mixed Use - Ret. / Res.	A11	3,376	0.34	30%	1,013	4	4,051	1.20	0%	0	0.043	0	4,051	4,051	90	20%	36	1.25	29	0
Resultant Development	Mixed Use - Ret. / Res.	A12	12,835	1.28	30%	3,851	4	15,402	1.20	0%	0	0.043	0	15,402	15,402	90	20%	137	1.25	110	0
Resultant Development	Mixed Use - Ret. / Res.	A13	1,978	0.20	50%	989	4	3,956	2.00	0%	0	0.043	0	3,956	3,956	90	20%	35	1.25	28	0
TOTAL			100,162	10		22,813		97,090			13,907		598		83,182			739		592	

PUBLC SPACE IMPROVEMENTS

		GFA (sq.m)	
Catalyst Project	Public Square	4,422	
Catalyst Project	Traffic Control Roundabouts	5,255	
Catalyst Project	Streetscape Improvements	35,504	Main / Beck
Catalyst Project	Gateways	3,268	
Catalyst Project	Bridge Improvements	4,528	
		52,977	

BEACH

		BLOCK								RETAIL				RESIDENTIAL AREA						
										% Of Ground Floor Footprint										
PROJECT TYPE	PLOT TYPE	BLOCK	BLOCK SIZE (sq.m)	HECTARES	DEV. ASSUMPTION	BULIDING (S) FOOTPRINT (sq.m)	HEIGHT (# Floors inc. GROUND)	GFA (sq.m)	FAR	% RETAIL	RETAIL GFA (sq.m)	PARKING UNITS / sq.m	PARKING REQ.	GFA LEFT	RESIDENTIAL GFA (sq.m)	AVG UNIT SIZE (sq.m)	Gross Efficiency (%)	# UNITS	PARKING UNITS / UNIT	PARKING REQ.	GFA LEFT
Catalyst Project	Mixed Use - Ent. / Ret. / Res.	B1	3,651	0.37	80%	2,921	4.5	13,144	3.60	75%	2,191	0.043	94	10,953	10,953	65	20%	135	1.25	108	0
Catalyst Project	Mixed Use - Ent. / Ret. / Res.	B2	2,365	0.24	80%	1,892	4.5	8,514	3.60	75%	1,419	0.043	61	7,095	7,095	65	20%	87	1.25	70	0
Catalyst Project	Mixed Use - Ent. / Ret. / Hotel	B3	6,025	0.60	70%	4,218	4.5	18,979	3.15	80%	3,374	0.043	145	15,605	15,605	80	20%	156	1.25	125	0
Catalyst Project	Residential	B4	6,703	0.67	35%	2,346	2.5	5,865	0.88	0%	0	0.043	0	5,865	5,865	100	20%	47	1.25	38	0
Catalyst Project	Entertainment	B5	25,326	2.53	10%	2,533	1.5	3,799	0.15	100%	2,533	0.043	109	1,266	0				1.25	0	1,266
Catalyst Project	Entertainment	B6	17,516	1.75	10%	1,752	1.5	2,627	0.15	100%	1,752	0.043	75	876	0				1.25	0	876
Resultant Development	Mixed Use - Ret. / Res.	B7	5,050	0.51	35%	1,768	4	7,070	1.40	0%	0	0.043	0	7,070	7,070	65	20%	87	1.25	70	0
Resultant Development	Mixed Use - Ret. / Res.	B8	10,556	1.06	35%	3,695	4	14,778	1.40	0%	0	0.043	0	14,778	14,778	65	20%	182	1.25	146	0
Resultant Development	Mixed Use - Ret. / Res.	B9	8,734	0.87	35%	3,057	4	12,228	1.40	0%	0	0.043	0	12,228	12,228	65	20%	150	1.25	120	0
Resultant Development	Mixed Use - Ret. / Res.	B10	9,067	0.91	40%	3,627	2.5	9,067	1.00	0%	0	0.043	0	9,067	9,067	65	20%	112	1.25	89	0
Peripheral	Mixed Use	B11	911	0.09	30%	273	3	820	0.90	80%	219	0.043	9	601	0	65	20%	0	1.25	0	601
Peripheral	Mixed Use	B12	1,850	0.19	30%	555	3	1,665	0.90	80%	444	0.043	19	1,221	0	65	20%	0	1.25	0	1,221
Peripheral	Mixed Use	B13	16,804	1.68	20%	3,361	5	16,804	1.00	40%	1,344	0.043	58	15,460	15,460	65	20%	190	1.25	152	0
Peripheral	Residential	B15	15,433	1.54	20%	3,087	2.5	7,717	0.50	0%	0	0.043	0	7,717	7,717	65	20%	95	1.25	76	0
TOTAL			129,991	13		35,082		123,076			13,275		571		105,837			1,241		993	

PUBLC SPACE IMPROVEMENTS

		GFA (sq.m)	
Catalyst Project	Beach Square	9,568	
Catalyst Project	Beach Boardwalk	8,731	
Catalyst Project	Traffic Control Roundabouts	2,805	
Catalyst Project	Streetscape Improvements	18,216	Mosely
Catalyst Project	Gateways	400	
		39,720	

Parking Assumptions

Retail	0.043 / sq.m
Entertainment	0.05 / sq.m
Residential	1.25 / unit
Hotel	

DOWNTOWN

Total sq.m	100,162	Total Retail	13,907
Total Hecatares	10.02	Total Residential	83,182
Total Development Footprint	22,813	Total Residential Units	739
Total GFA	97,090		
Average FAR	1.15		

BEACH

Total sq.m	129,991	Total Retail	13,275
Total Hecatares	13	Total Residential	105,837
Total Development Footprint	35,082	Total Residential Units	1,241
Total GFA	123,076		
Average FAR	1.43		

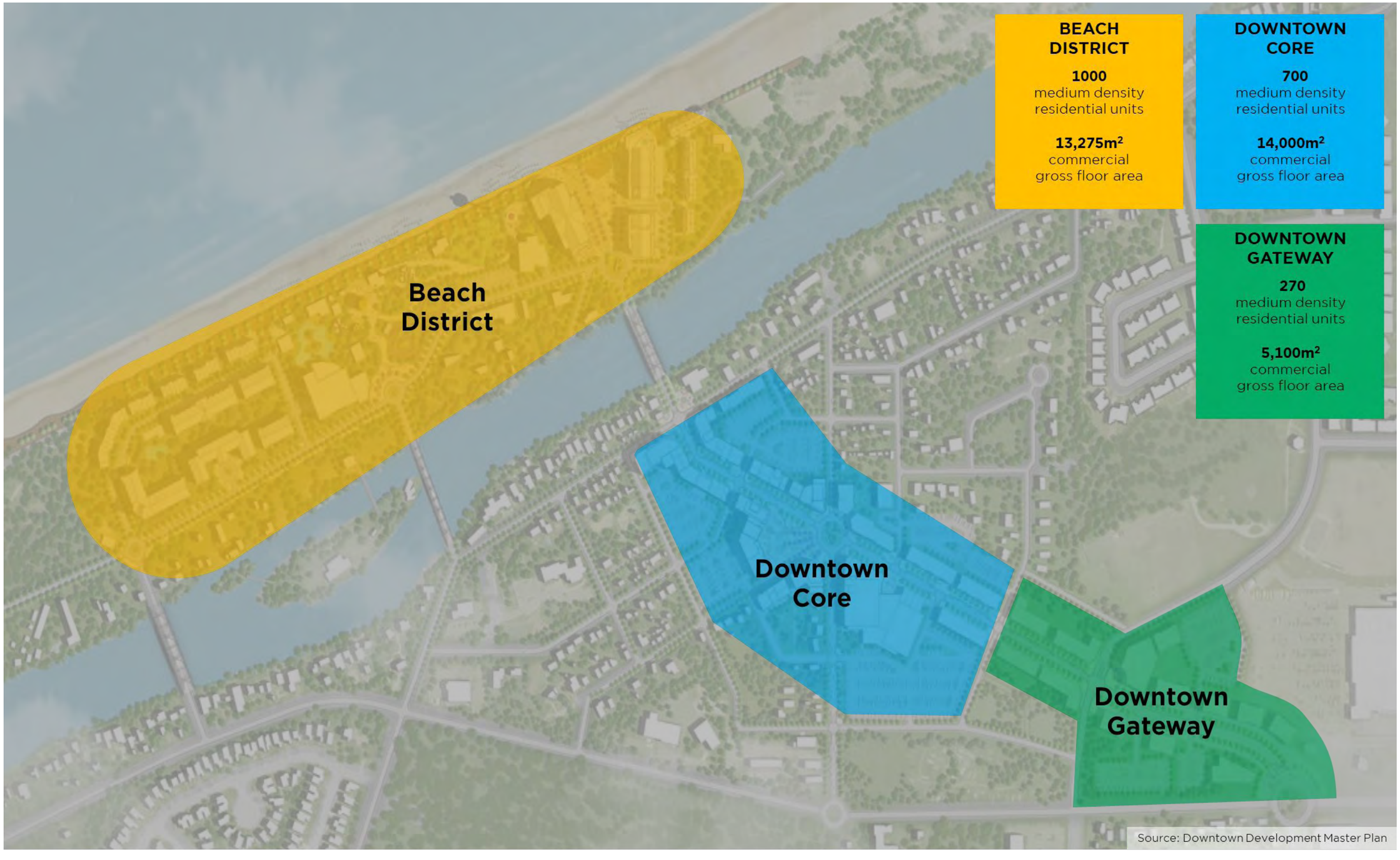
Assumed Future Development Levels

BEACH			Residential		Commercial	
	Land Parcel	Area Ha	Density Units/Ha	Units	Coverage	GFA 1000ft²
North Side	6th to 5th St.	1.1	78	86	0%	0
	5th to 4th St.	1.14	78	89	0%	0
	4th to 3rd St.	1.06	78	83	0%	0
	3rd to 2nd St.	1.19	78	93	15%	19
	2nd to 1st St.	0.92	78	72	5%	5
	1st to Main St.	2.73	78	213	8%	24
	Main to Spruce	0.53	78	41	65%	37
	Spruce to East Lir	0.79	78	62	45%	38
	Sub-total	**9.46**		**738**		**123**
South Side	6th to 5th St.	0.49	78	38	0%	0
	5th to 4th St.	0.41	78	32	0%	0
	4th to 3rd St.	0.49	78	38	0%	0
	3rd to 2nd St.	0.47	78	37	0%	0
	2nd to Willow	1.82	78	142	7%	14
	Willow to Main	0.18	78	14	25%	5
	Sub-total	**3.86**		**301**		**19**
TOTAL		**13.32**		**1039**		**142**
As per DDMP		**13.1**		**1241**		**143**

DOWNTOWN CORE		Area		Residential		Commercial	
	Land Parcel	Total Ha	Developed Ha	Density Units/Ha	Units	Coverage	GFA 1000ft²
North Side	W to Glenwood ext	2.25	0.90	78	70	20%	19
	Glenwood ext to Elm	1.83	0.73	78	57	20%	16
	Elm to Wood Ave	3.84	1.53	78	119	10%	16
	Sub-total	**7.92**	**3.15**		**246**		**51**
South Side	W to Glenwood	2.5	1.00	78	78	20%	21
	Glenwood to Forest Ave	1.73	0.69	78	54	20%	15
	Forest Ave to Elm exten	6	2.39	78	186	20%	51
	Elm ext to Wood Ave	2.7	1.07	78	84	10%	12
	Sub-total	**12.93**	**5.15**		**401**		**99**
TOTAL		**20.85**	**8.30**		**647**		**151**
As per DDMP			**10.02**		**739**		**150**

DOWNTOWN GATEWAY		Area	Residential		Commercial	
	Land Parcel	Total Ha	Density Units/Ha	Units	Coverage	GFA 1000ft²
North Side	Wood to Stonebridge	2.44	25	61	10%	26
	Stonebridge to east	2.31	25	58	10%	25
	Sub-total	**4.75**		**119**		**51**
South Side	Wood ext to Stonebridg	1.68	25	42	0%	0
	Stonebridge to Main	1.8	20	36	5%	4
	Stonebridge to Main (S)	1.12	25	28	0%	0
	Main to Zoo	1.62	25	41	0%	0
	Sub-total	**6.22**		**147**		**4**
TOTAL		**10.97**		**265**		**55**

Assumed Future Development Levels



Source: Downtown Development Master Plan

Appendix D:
Future Traffic Operations

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	82	9	470	384	9
Future Volume (Veh/h)	37	82	9	470	384	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	89	10	511	417	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	953	422	427			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	953	422	427			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	86	99			
cM capacity (veh/h)	283	627	1122			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	129	521	427
Volume Left	40	10	0
Volume Right	89	0	10
cSH	455	1122	1700
Volume to Capacity	0.28	0.01	0.25
Queue Length 95th (m)	8.8	0.2	0.0
Control Delay (s)	16.0	0.3	0.0
Lane LOS	C	A	
Approach Delay (s)	16.0	0.3	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	0	43	0	0	0	34	473	0	0	353	76
Future Volume (Veh/h)	70	0	43	0	0	0	34	473	0	0	353	76
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	0	47	0	0	0	37	514	0	0	384	83
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	972	972	384	1019	1055	514	467			514		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	972	972	384	1019	1055	514	467			514		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	66	100	93	100	100	100	97			100		
cM capacity (veh/h)	224	242	659	193	216	557	1084			1041		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	123	0	551	384	83
Volume Left	76	0	37	0	0
Volume Right	47	0	0	0	83
cSH	299	1700	1084	1700	1700
Volume to Capacity	0.41	0.00	0.03	0.23	0.05
Queue Length 95th (m)	14.6	0.0	0.8	0.0	0.0
Control Delay (s)	25.2	0.0	1.0	0.0	0.0
Lane LOS	D	A	A		
Approach Delay (s)	25.2	0.0	1.0	0.0	
Approach LOS	D	A			

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	61.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	40	0	544	387	0
Future Volume (Veh/h)	65	40	0	544	387	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	43	0	591	421	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1012	210	421			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1012	210	421			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	95	100			
cM capacity (veh/h)	232	789	1120			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	71	43	591	210	210
Volume Left	71	0	0	0	0
Volume Right	0	43	0	0	0
cSH	232	789	1700	1700	1700
Volume to Capacity	0.31	0.05	0.35	0.12	0.12
Queue Length 95th (m)	9.5	1.3	0.0	0.0	0.0
Control Delay (s)	27.2	9.8	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	20.6		0.0	0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	95	554	354	192	0	0
Future Volume (Veh/h)	95	554	354	192	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	602	385	209	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	594				1298	297
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	594				1298	297
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				100	100
cM capacity (veh/h)	965				135	693

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	103	602	257	337	0
Volume Left	103	0	0	0	0
Volume Right	0	0	0	209	0
cSH	965	1700	1700	1700	1700
Volume to Capacity	0.11	0.35	0.15	0.20	0.00
Queue Length 95th (m)	2.7	0.0	0.0	0.0	0.0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0
Lane LOS	A				A
Approach Delay (s)	1.3		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	369	80	59	443	26	0	0	0	13	24	104
Future Volume (Veh/h)	105	369	80	59	443	26	0	0	0	13	24	104
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	401	87	64	482	28	0	0	0	14	26	113
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	510			488			1168	1310	444	1296	1340	255
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	510			488			1168	1310	444	1296	1340	255
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			94			100	100	100	86	79	85
cM capacity (veh/h)	1037			1057			91	130	556	103	124	738

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	602	305	269	153
Volume Left	114	64	0	14
Volume Right	87	0	28	113
cSH	1037	1057	1700	307
Volume to Capacity	0.11	0.06	0.16	0.50
Queue Length 95th (m)	2.8	1.5	0.0	19.9
Control Delay (s)	2.8	2.3	0.0	27.8
Lane LOS	A	A		D
Approach Delay (s)	2.8	1.2		27.8
Approach LOS				D

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	63.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	26	113	1	7	121
Future Volume (Veh/h)	3	26	113	1	7	121
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	28	123	1	8	132
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	272	124			124	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	272	124			124	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	710	922			1450	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	31	124	140
Volume Left	3	0	8
Volume Right	28	1	0
cSH	896	1700	1450
Volume to Capacity	0.03	0.07	0.01
Queue Length 95th (m)	0.8	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	361	41	66	446	14	40	17	55	11	9	10
Future Volume (Veh/h)	13	361	41	66	446	14	40	17	55	11	9	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	392	45	72	485	15	43	18	60	12	10	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	500			437			845	1086	218	930	1102	250
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	500			437			845	1086	218	930	1102	250
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			81	91	92	93	95	99
cM capacity (veh/h)	1046			1105			225	195	780	177	191	744

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	210	241	314	258	121	33
Volume Left	14	0	72	0	43	12
Volume Right	0	45	0	15	60	11
cSH	1046	1700	1105	1700	336	245
Volume to Capacity	0.01	0.14	0.07	0.15	0.36	0.13
Queue Length 95th (m)	0.3	0.0	1.6	0.0	12.1	3.5
Control Delay (s)	0.7	0.0	2.4	0.0	21.6	22.0
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		1.3		21.6	22.0
Approach LOS					C	C

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	275	36	24	366	47	23	144	4	44	77	88
Future Volume (vph)	110	275	36	24	366	47	23	144	4	44	77	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.98		1.00	1.00		1.00	0.92	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3420			3444		1755	1840		1755	1699	
Flt Permitted		0.76			0.93		0.63	1.00		0.66	1.00	
Satd. Flow (perm)		2649			3195		1156	1840		1210	1699	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	299	39	26	398	51	25	157	4	48	84	96
RTOR Reduction (vph)	0	7	0	0	10	0	0	2	0	0	79	0
Lane Group Flow (vph)	0	451	0	0	465	0	25	159	0	48	101	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0			30.0		7.9	7.9		7.9	7.9	
Effective Green, g (s)		30.0			30.0		7.9	7.9		7.9	7.9	
Actuated g/C Ratio		0.65			0.65		0.17	0.17		0.17	0.17	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1731			2088		198	316		208	292	
v/s Ratio Prot								c0.09			0.06	
v/s Ratio Perm		c0.17			0.15		0.02			0.04		
v/c Ratio		0.26			0.22		0.13	0.50		0.23	0.34	
Uniform Delay, d1		3.3			3.2		16.1	17.2		16.4	16.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.2		0.3	1.3		0.6	0.7	
Delay (s)		3.7			3.5		16.4	18.5		17.0	17.4	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		3.7			3.5			18.2			17.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	45.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	22	32	22	15	17	27	393	32	13	366	325
Future Volume (vph)	298	22	32	22	15	17	27	393	32	13	366	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.91		1.00	0.92			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)	1755	1683		1755	1701			3462			3504	1570
Flt Permitted	0.59	1.00		0.72	1.00			0.91			0.93	1.00
Satd. Flow (perm)	1097	1683		1327	1701			3171			3274	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	324	24	35	24	16	18	29	427	35	14	398	353
RTOR Reduction (vph)	0	16	0	0	12	0	0	9	0	0	0	247
Lane Group Flow (vph)	324	43	0	24	22	0	0	482	0	0	412	106
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	32.9	32.9		18.9	18.9			18.1			18.1	18.1
Effective Green, g (s)	32.9	32.9		18.9	18.9			18.1			18.1	18.1
Actuated g/C Ratio	0.55	0.55		0.31	0.31			0.30			0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	705	922		418	535			956			987	473
v/s Ratio Prot	c0.07	0.03			0.01							
v/s Ratio Perm	c0.18			0.02				c0.15			0.13	0.07
v/c Ratio	0.46	0.05		0.06	0.04			0.50			0.42	0.23
Uniform Delay, d1	7.7	6.3		14.3	14.3			17.3			16.7	15.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.5	0.1		0.3	0.1			1.9			1.3	1.1
Delay (s)	8.2	6.4		14.6	14.4			19.2			18.0	16.8
Level of Service	A	A		B	B			B			B	B
Approach Delay (s)		7.9			14.5			19.2			17.5	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	107	10	585	351	9
Future Volume (Veh/h)	47	107	10	585	351	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	116	11	636	382	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1045	387	392			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1045	387	392			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	82	99			
cM capacity (veh/h)	249	657	1156			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	167	647	392
Volume Left	51	11	0
Volume Right	116	0	10
cSH	438	1156	1700
Volume to Capacity	0.38	0.01	0.23
Queue Length 95th (m)	13.4	0.2	0.0
Control Delay (s)	18.2	0.3	0.0
Lane LOS	C	A	
Approach Delay (s)	18.2	0.3	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	0	54	0	0	0	38	594	0	0	306	82
Future Volume (Veh/h)	89	0	54	0	0	0	38	594	0	0	306	82
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	0	59	0	0	0	41	646	0	0	333	89
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1061	1061	333	1120	1150	646	422			646		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1061	1061	333	1120	1150	646	422			646		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	100	92	100	100	100	96			100		
cM capacity (veh/h)	194	214	704	162	189	468	1127			930		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	156	0	687	333	89
Volume Left	97	0	41	0	0
Volume Right	59	0	0	0	89
cSH	268	1700	1127	1700	1700
Volume to Capacity	0.58	0.00	0.04	0.20	0.05
Queue Length 95th (m)	25.7	0.0	0.9	0.0	0.0
Control Delay (s)	35.7	0.0	1.0	0.0	0.0
Lane LOS	E	A	A		
Approach Delay (s)	35.7	0.0	1.0	0.0	
Approach LOS	E	A			

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	67.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	81	47	0	683	341	0
Future Volume (Veh/h)	81	47	0	683	341	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	51	0	742	371	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1113	186	371			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1113	186	371			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	56	94	100			
cM capacity (veh/h)	199	819	1170			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	88	51	742	186	186
Volume Left	88	0	0	0	0
Volume Right	0	51	0	0	0
cSH	199	819	1700	1700	1700
Volume to Capacity	0.44	0.06	0.44	0.11	0.11
Queue Length 95th (m)	15.7	1.5	0.0	0.0	0.0
Control Delay (s)	36.6	9.7	0.0	0.0	0.0
Lane LOS	E	A			
Approach Delay (s)	26.7		0.0	0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	135	697	316	285	0	0
Future Volume (Veh/h)	135	697	316	285	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	147	758	343	310	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	653				1550	326
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	653				1550	326
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				100	100
cM capacity (veh/h)	916				86	663

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	147	758	229	424	0
Volume Left	147	0	0	0	0
Volume Right	0	0	0	310	0
cSH	916	1700	1700	1700	1700
Volume to Capacity	0.16	0.45	0.13	0.25	0.00
Queue Length 95th (m)	4.3	0.0	0.0	0.0	0.0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0
Lane LOS	A				A
Approach Delay (s)	1.6		0.0		0.0
Approach LOS					A

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	40.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	494	88	64	488	29	0	0	0	14	26	114
Future Volume (Veh/h)	116	494	88	64	488	29	0	0	0	14	26	114
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	126	537	96	70	530	32	0	0	0	15	28	124
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	562			633			1380	1539	585	1523	1571	281
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	562			633			1380	1539	585	1523	1571	281
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			92			100	100	100	78	68	83
cM capacity (veh/h)	992			932			54	91	449	68	87	710

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	759	335	297	167
Volume Left	126	70	0	15
Volume Right	96	0	32	124
cSH	992	932	1700	232
Volume to Capacity	0.13	0.08	0.17	0.72
Queue Length 95th (m)	3.3	1.8	0.0	36.7
Control Delay (s)	3.1	2.6	0.0	52.3
Lane LOS	A	A		F
Approach Delay (s)	3.1	1.4		52.3
Approach LOS				F

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	29	124	1	8	133
Future Volume (Veh/h)	3	29	124	1	8	133
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	32	135	1	9	145
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	298	136			136	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	298	136			136	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			99	
cM capacity (veh/h)	684	908			1436	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	35	136	154
Volume Left	3	0	9
Volume Right	32	1	0
cSH	883	1700	1436
Volume to Capacity	0.04	0.08	0.01
Queue Length 95th (m)	0.9	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	460	45	72	535	15	45	18	61	12	10	12
Future Volume (Veh/h)	14	460	45	72	535	15	45	18	61	12	10	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	500	49	78	582	16	49	20	66	13	11	13
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	598			549			1020	1308	274	1102	1325	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	598			549			1020	1308	274	1102	1325	299
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			92			70	86	91	89	92	98
cM capacity (veh/h)	961			1003			161	141	717	123	138	691

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	265	299	369	307	135	37
Volume Left	15	0	78	0	49	13
Volume Right	0	49	0	16	66	13
cSH	961	1700	1003	1700	251	181
Volume to Capacity	0.02	0.18	0.08	0.18	0.54	0.20
Queue Length 95th (m)	0.4	0.0	1.9	0.0	22.1	5.6
Control Delay (s)	0.7	0.0	2.5	0.0	34.9	29.9
Lane LOS	A		A		D	D
Approach Delay (s)	0.3		1.4		34.9	29.9
Approach LOS					D	D

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	51.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	375	39	26	486	52	26	159	5	48	85	97
Future Volume (vph)	118	375	39	26	486	52	26	159	5	48	85	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	1.00		1.00	0.92	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3433			3453		1755	1839		1755	1700	
Flt Permitted		0.74			0.92		0.58	1.00		0.63	1.00	
Satd. Flow (perm)		2579			3192		1073	1839		1155	1700	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	128	408	42	28	528	57	28	173	5	52	92	105
RTOR Reduction (vph)	0	7	0	0	9	0	0	2	0	0	84	0
Lane Group Flow (vph)	0	571	0	0	604	0	28	176	0	52	113	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		31.2			31.2		9.8	9.8		9.8	9.8	
Effective Green, g (s)		31.2			31.2		9.8	9.8		9.8	9.8	
Actuated g/C Ratio		0.64			0.64		0.20	0.20		0.20	0.20	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1642			2032		214	367		231	340	
v/s Ratio Prot								c0.10			0.07	
v/s Ratio Perm		c0.22			0.19		0.03			0.05		
v/c Ratio		0.35			0.30		0.13	0.48		0.23	0.33	
Uniform Delay, d1		4.2			4.0		16.1	17.3		16.4	16.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			0.4		0.3	1.0		0.5	0.6	
Delay (s)		4.7			4.4		16.4	18.3		16.9	17.4	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		4.7			4.4			18.1			17.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	347	26	37	24	23	18	34	432	36	14	402	447
Future Volume (vph)	347	26	37	24	23	18	34	432	36	14	402	447
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.91		1.00	0.93			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)	1755	1684		1755	1724			3460			3504	1570
Flt Permitted	0.59	1.00		0.71	1.00			0.90			0.93	1.00
Satd. Flow (perm)	1092	1684		1317	1724			3124			3267	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	28	40	26	25	20	37	470	39	15	437	486
RTOR Reduction (vph)	0	18	0	0	14	0	0	10	0	0	0	336
Lane Group Flow (vph)	377	50	0	26	32	0	0	536	0	0	452	150
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	32.5	32.5		19.5	19.5			18.5			18.5	18.5
Effective Green, g (s)	32.5	32.5		19.5	19.5			18.5			18.5	18.5
Actuated g/C Ratio	0.54	0.54		0.32	0.32			0.31			0.31	0.31
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	685	912		428	560			963			1007	484
v/s Ratio Prot	c0.08	0.03			0.02							
v/s Ratio Perm	c0.22			0.02				c0.17			0.14	0.10
v/c Ratio	0.55	0.05		0.06	0.06			0.56			0.45	0.31
Uniform Delay, d1	8.3	6.5		13.9	13.9			17.3			16.7	15.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	1.0	0.1		0.3	0.2			2.3			1.4	1.7
Delay (s)	9.2	6.6		14.2	14.1			19.6			18.1	17.5
Level of Service	A	A		B	B			B			B	B
Approach Delay (s)		8.8			14.2			19.6			17.8	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	88	13	612	516	13
Future Volume (Veh/h)	42	88	13	612	516	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	96	14	665	561	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1261	568	575			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1261	568	575			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	81	99			
cM capacity (veh/h)	183	519	988			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	142	679	575
Volume Left	46	14	0
Volume Right	96	0	14
cSH	326	988	1700
Volume to Capacity	0.44	0.01	0.34
Queue Length 95th (m)	16.1	0.3	0.0
Control Delay (s)	24.3	0.4	0.0
Lane LOS	C	A	
Approach Delay (s)	24.3	0.4	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	0	61	0	0	0	54	600	0	0	473	97
Future Volume (Veh/h)	88	0	61	0	0	0	54	600	0	0	473	97
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	0	66	0	0	0	59	652	0	0	514	105
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1284	1284	514	1350	1389	652	619			652		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1284	1284	514	1350	1389	652	619			652		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	28	100	88	100	100	100	94			100		
cM capacity (veh/h)	134	153	557	106	132	464	952			925		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	162	0	711	514	105
Volume Left	96	0	59	0	0
Volume Right	66	0	0	0	105
cSH	194	1700	952	1700	1700
Volume to Capacity	0.84	0.00	0.06	0.30	0.06
Queue Length 95th (m)	46.1	0.0	1.5	0.0	0.0
Control Delay (s)	78.2	0.0	1.6	0.0	0.0
Lane LOS	F	A	A		
Approach Delay (s)	78.2	0.0	1.6	0.0	
Approach LOS	F	A			

Intersection Summary				
Average Delay	9.2			
Intersection Capacity Utilization	78.1%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	96	69	0	688	498	0
Future Volume (Veh/h)	96	69	0	688	498	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	75	0	748	541	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1289	270	541			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1289	270	541			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	32	90	100			
cM capacity (veh/h)	153	721	1010			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	104	75	748	270	270
Volume Left	104	0	0	0	0
Volume Right	0	75	0	0	0
cSH	153	721	1700	1700	1700
Volume to Capacity	0.68	0.10	0.44	0.16	0.16
Queue Length 95th (m)	29.7	2.6	0.0	0.0	0.0
Control Delay (s)	68.0	10.6	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	43.9		0.0	0.0	
Approach LOS	E				

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	128	697	464	228	0	0
Future Volume (Veh/h)	128	697	464	228	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	758	504	248	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	752				1664	376
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	752				1664	376
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				100	100
cM capacity (veh/h)	840				72	616

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	139	758	336	416	0
Volume Left	139	0	0	0	0
Volume Right	0	0	0	248	0
cSH	840	1700	1700	1700	1700
Volume to Capacity	0.17	0.45	0.20	0.24	0.00
Queue Length 95th (m)	4.5	0.0	0.0	0.0	0.0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0
Lane LOS	B				A
Approach Delay (s)	1.6		0.0		0.0
Approach LOS					A

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	40.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	493	89	72	580	37	0	0	0	22	25	112
Future Volume (Veh/h)	115	493	89	72	580	37	0	0	0	22	25	112
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	536	97	78	630	40	0	0	0	24	27	122
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	670			633			1441	1660	584	1640	1689	335
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	670			633			1441	1660	584	1640	1689	335
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			92			100	100	100	56	62	81
cM capacity (veh/h)	903			932			45	75	450	54	72	655

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	758	393	355	173
Volume Left	125	78	0	24
Volume Right	97	0	40	122
cSH	903	932	1700	172
Volume to Capacity	0.14	0.08	0.21	1.01
Queue Length 95th (m)	3.6	2.1	0.0	61.7
Control Delay (s)	3.4	2.6	0.0	124.5
Lane LOS	A	A		F
Approach Delay (s)	3.4	1.4		124.5
Approach LOS				F

Intersection Summary			
Average Delay	15.0		
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	27	116	1	8	124
Future Volume (Veh/h)	3	27	116	1	8	124
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	29	126	1	9	135
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	280	126			127	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	280	126			127	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	702	918			1447	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	127	144
Volume Left	3	0	9
Volume Right	29	1	0
cSH	893	1700	1447
Volume to Capacity	0.04	0.07	0.01
Queue Length 95th (m)	0.8	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	474	71	106	566	22	66	17	88	19	10	16
Future Volume (Veh/h)	19	474	71	106	566	22	66	17	88	19	10	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	515	77	115	615	24	72	18	96	21	11	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	639			592			1156	1464	296	1262	1491	320
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	639			592			1156	1464	296	1262	1491	320
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			88			40	83	86	75	89	97
cM capacity (veh/h)	927			966			120	108	694	84	104	670

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	278	334	422	332	186	49
Volume Left	21	0	115	0	72	21
Volume Right	0	77	0	24	96	17
cSH	927	1700	966	1700	205	128
Volume to Capacity	0.02	0.20	0.12	0.20	0.91	0.38
Queue Length 95th (m)	0.5	0.0	3.1	0.0	55.1	12.1
Control Delay (s)	0.9	0.0	3.5	0.0	88.8	49.4
Lane LOS	A		A		F	E
Approach Delay (s)	0.4		2.0		88.8	49.4
Approach LOS					F	E

Intersection Summary				
Average Delay	12.9			
Intersection Capacity Utilization	57.7%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	404	43	25	513	57	32	154	4	53	85	104
Future Volume (vph)	129	404	43	25	513	57	32	154	4	53	85	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	1.00		1.00	0.92	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3432			3452		1755	1841		1755	1694	
Flt Permitted		0.73			0.92		0.55	1.00		0.63	1.00	
Satd. Flow (perm)		2521			3193		1024	1841		1172	1694	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	439	47	27	558	62	35	167	4	58	92	113
RTOR Reduction (vph)	0	7	0	0	10	0	0	2	0	0	91	0
Lane Group Flow (vph)	0	619	0	0	637	0	35	169	0	58	114	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		32.2			32.2		9.8	9.8		9.8	9.8	
Effective Green, g (s)		32.2			32.2		9.8	9.8		9.8	9.8	
Actuated g/C Ratio		0.64			0.64		0.20	0.20		0.20	0.20	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1623			2056		200	360		229	332	
v/s Ratio Prot								c0.09			0.07	
v/s Ratio Perm		c0.25			0.20		0.03			0.05		
v/c Ratio		0.38			0.31		0.17	0.47		0.25	0.34	
Uniform Delay, d1		4.2			4.0		16.7	17.8		17.0	17.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.4		0.4	1.0		0.6	0.6	
Delay (s)		4.9			4.4		17.2	18.8		17.6	18.0	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		4.9			4.4			18.5			17.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	423	23	46	23	15	17	42	405	33	13	377	466
Future Volume (vph)	423	23	46	23	15	17	42	405	33	13	377	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.90		1.00	0.92			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)	1755	1662		1755	1701			3458			3504	1570
Flt Permitted	0.59	1.00		0.71	1.00			0.88			0.93	1.00
Satd. Flow (perm)	1097	1662		1308	1701			3068			3272	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	460	25	50	25	16	18	46	440	36	14	410	507
RTOR Reduction (vph)	0	23	0	0	12	0	0	9	0	0	0	354
Lane Group Flow (vph)	460	52	0	25	22	0	0	513	0	0	424	153
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	32.9	32.9		18.9	18.9			18.1			18.1	18.1
Effective Green, g (s)	32.9	32.9		18.9	18.9			18.1			18.1	18.1
Actuated g/C Ratio	0.55	0.55		0.31	0.31			0.30			0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	705	911		412	535			925			987	473
v/s Ratio Prot	c0.10	0.03			0.01							
v/s Ratio Perm	c0.25			0.02				c0.17			0.13	0.10
v/c Ratio	0.65	0.06		0.06	0.04			0.55			0.43	0.32
Uniform Delay, d1	8.6	6.3		14.4	14.3			17.6			16.8	16.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.2	0.1		0.3	0.1			2.4			1.4	1.8
Delay (s)	10.8	6.4		14.6	14.4			20.0			18.2	18.0
Level of Service	B	A		B	B			B			B	B
Approach Delay (s)		10.2			14.5			20.0			18.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	53	114	15	741	513	14
Future Volume (Veh/h)	53	114	15	741	513	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	124	16	805	558	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1402	566	573			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1402	566	573			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	61	76	98			
cM capacity (veh/h)	150	520	990			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	182	821	573
Volume Left	58	16	0
Volume Right	124	0	15
cSH	291	990	1700
Volume to Capacity	0.62	0.02	0.34
Queue Length 95th (m)	29.5	0.4	0.0
Control Delay (s)	35.9	0.4	0.0
Lane LOS	E	A	
Approach Delay (s)	35.9	0.4	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	0	74	0	0	0	58	736	0	0	453	103
Future Volume (Veh/h)	110	0	74	0	0	0	58	736	0	0	453	103
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	0	80	0	0	0	63	800	0	0	492	112
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1418	1418	492	1498	1530	800	604			800		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1418	1418	492	1498	1530	800	604			800		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	86	100	100	100	93			100		
cM capacity (veh/h)	108	127	573	81	108	382	964			814		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	200	0	863	492	112
Volume Left	120	0	63	0	0
Volume Right	80	0	0	0	112
cSH	159	1700	964	1700	1700
Volume to Capacity	1.25	0.00	0.07	0.29	0.07
Queue Length 95th (m)	87.8	0.0	1.6	0.0	0.0
Control Delay (s)	211.4	0.0	1.7	0.0	0.0
Lane LOS	F	A	A		
Approach Delay (s)	211.4	0.0	1.7	0.0	
Approach LOS	F	A			

Intersection Summary				
Average Delay	26.2			
Intersection Capacity Utilization	86.4%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	115	81	0	846	475	0
Future Volume (Veh/h)	115	81	0	846	475	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	88	0	920	516	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1436	258	516			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1436	258	516			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	88	100			
cM capacity (veh/h)	122	735	1032			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	125	88	920	258	258
Volume Left	125	0	0	0	0
Volume Right	0	88	0	0	0
cSH	122	735	1700	1700	1700
Volume to Capacity	1.02	0.12	0.54	0.15	0.15
Queue Length 95th (m)	53.4	3.1	0.0	0.0	0.0
Control Delay (s)	156.6	10.6	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	96.3		0.0	0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	12.4		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	173	859	450	327	0	0
Future Volume (Veh/h)	173	859	450	327	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	188	934	489	355	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	844				1976	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	844				1976	422
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	76				100	100
cM capacity (veh/h)	775				40	575

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	188	934	326	518	0
Volume Left	188	0	0	0	0
Volume Right	0	0	0	355	0
cSH	775	1700	1700	1700	1700
Volume to Capacity	0.24	0.55	0.19	0.30	0.00
Queue Length 95th (m)	7.2	0.0	0.0	0.0	0.0
Control Delay (s)	11.1	0.0	0.0	0.0	0.0
Lane LOS	B				A
Approach Delay (s)	1.9		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	634	98	78	653	40	0	0	0	25	27	124
Future Volume (Veh/h)	126	634	98	78	653	40	0	0	0	25	27	124
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	689	107	85	710	43	0	0	0	27	29	135
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	753			796			1691	1940	742	1918	1972	376
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	753			796			1691	1940	742	1918	1972	376
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			89			100	100	100	16	36	78
cM capacity (veh/h)	840			809			19	47	353	32	45	615

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	933	440	398	191
Volume Left	137	85	0	27
Volume Right	107	0	43	135
cSH	840	809	1700	112
Volume to Capacity	0.16	0.11	0.23	1.70
Queue Length 95th (m)	4.4	2.7	0.0	111.8
Control Delay (s)	4.1	3.0	0.0	417.6
Lane LOS	A	A		F
Approach Delay (s)	4.1	1.6		417.6
Approach LOS				F

Intersection Summary				
Average Delay	43.3			
Intersection Capacity Utilization	88.3%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	29	127	1	8	137
Future Volume (Veh/h)	4	29	127	1	8	137
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	32	138	1	9	149
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	306	138			139	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	306	138			139	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	96			99	
cM capacity (veh/h)	678	904			1432	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	139	158
Volume Left	4	0	9
Volume Right	32	1	0
cSH	872	1700	1432
Volume to Capacity	0.04	0.08	0.01
Queue Length 95th (m)	1.0	0.0	0.1
Control Delay (s)	9.3	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	585	78	115	679	24	73	19	96	21	11	17
Future Volume (Veh/h)	21	585	78	115	679	24	73	19	96	21	11	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	636	85	125	738	26	79	21	104	23	12	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	764			721			1368	1738	360	1480	1768	382
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	764			721			1368	1738	360	1480	1768	382
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			86			0	70	84	52	82	97
cM capacity (veh/h)	832			863			76	70	630	48	67	610

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	341	403	494	395	204	53
Volume Left	23	0	125	0	79	23
Volume Right	0	85	0	26	104	18
cSH	832	1700	863	1700	136	77
Volume to Capacity	0.03	0.24	0.14	0.23	1.50	0.68
Queue Length 95th (m)	0.6	0.0	3.8	0.0	106.3	24.2
Control Delay (s)	0.9	0.0	3.9	0.0	319.7	119.7
Lane LOS	A		A		F	F
Approach Delay (s)	0.4		2.1		319.7	119.7
Approach LOS					F	F

Intersection Summary				
Average Delay	39.0			
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	519	47	27	644	64	34	170	5	59	94	114
Future Volume (vph)	134	519	47	27	644	64	34	170	5	59	94	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	1.00		1.00	0.92	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3441			3457		1755	1840		1755	1695	
Flt Permitted		0.71			0.92		0.50	1.00		0.58	1.00	
Satd. Flow (perm)		2451			3182		929	1840		1079	1695	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	146	564	51	29	700	70	37	185	5	64	102	124
RTOR Reduction (vph)	0	7	0	0	9	0	0	2	0	0	87	0
Lane Group Flow (vph)	0	754	0	0	790	0	37	188	0	64	139	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		33.4			33.4		10.5	10.5		10.5	10.5	
Effective Green, g (s)		33.4			33.4		10.5	10.5		10.5	10.5	
Actuated g/C Ratio		0.64			0.64		0.20	0.20		0.20	0.20	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1577			2047		187	372		218	342	
v/s Ratio Prot								c0.10			0.08	
v/s Ratio Perm		c0.31			0.25		0.04			0.06		
v/c Ratio		0.48			0.39		0.20	0.51		0.29	0.41	
Uniform Delay, d1		4.8			4.4		17.2	18.4		17.6	18.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0			0.6		0.5	1.1		0.8	0.8	
Delay (s)		5.8			4.9		17.7	19.5		18.3	18.8	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		5.8			4.9			19.2			18.7	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	486	27	52	25	24	19	50	445	37	14	414	599
Future Volume (vph)	486	27	52	25	24	19	50	445	37	14	414	599
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.90		1.00	0.93			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)	1755	1664		1755	1723			3457			3504	1570
Flt Permitted	0.58	1.00		0.70	1.00			0.87			0.93	1.00
Satd. Flow (perm)	1079	1664		1295	1723			3018			3264	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	528	29	57	27	26	21	54	484	40	15	450	651
RTOR Reduction (vph)	0	26	0	0	15	0	0	9	0	0	0	455
Lane Group Flow (vph)	528	60	0	27	32	0	0	569	0	0	465	196
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	32.9	32.9		18.5	18.5			18.1			18.1	18.1
Effective Green, g (s)	32.9	32.9		18.5	18.5			18.1			18.1	18.1
Actuated g/C Ratio	0.55	0.55		0.31	0.31			0.30			0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	703	912		399	531			910			984	473
v/s Ratio Prot	c0.12	0.04			0.02							
v/s Ratio Perm	c0.29			0.02				c0.19			0.14	0.13
v/c Ratio	0.75	0.07		0.07	0.06			0.63			0.47	0.42
Uniform Delay, d1	9.6	6.4		14.7	14.6			18.0			17.1	16.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	4.5	0.1		0.3	0.2			3.2			1.6	2.7
Delay (s)	14.1	6.5		15.0	14.8			21.3			18.7	19.4
Level of Service	B	A		B	B			C			B	B
Approach Delay (s)		13.0			14.9			21.3			19.1	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	51	100	22	895	782	22
Future Volume (Veh/h)	51	100	22	895	782	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	109	24	973	850	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1883	862	874			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1883	862	874			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	26	69	97			
cM capacity (veh/h)	75	352	764			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	164	997	874
Volume Left	55	24	0
Volume Right	109	0	24
cSH	157	764	1700
Volume to Capacity	1.05	0.03	0.51
Queue Length 95th (m)	63.3	0.7	0.0
Control Delay (s)	143.4	0.9	0.0
Lane LOS	F	A	
Approach Delay (s)	143.4	0.9	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	12.0		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	0	95	0	0	0	93	853	0	0	713	139
Future Volume (Veh/h)	124	0	95	0	0	0	93	853	0	0	713	139
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	135	0	103	0	0	0	101	927	0	0	775	151
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1904	1904	775	2007	2055	927	926			927		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1904	1904	775	2007	2055	927	926			927		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	74	100	100	100	86			100		
cM capacity (veh/h)	46	59	395	29	47	322	730			729		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	238	0	1028	775	151
Volume Left	135	0	101	0	0
Volume Right	103	0	0	0	151
cSH	75	1700	730	1700	1700
Volume to Capacity	3.19	0.00	0.14	0.46	0.09
Queue Length 95th (m)	Err	0.0	3.6	0.0	0.0
Control Delay (s)	Err	0.0	4.0	0.0	0.0
Lane LOS	F	A	A		
Approach Delay (s)	Err	0.0	4.0	0.0	
Approach LOS	F	A			

Intersection Summary				
Average Delay	1087.5			
Intersection Capacity Utilization	110.2%	ICU Level of Service	H	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	156	128	0	977	721	0
Future Volume (Veh/h)	156	128	0	977	721	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	170	139	0	1062	784	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1846	392	784			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1846	392	784			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	77	100			
cM capacity (veh/h)	65	601	817			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	170	139	1062	392	392
Volume Left	170	0	0	0	0
Volume Right	0	139	0	0	0
cSH	65	601	1700	1700	1700
Volume to Capacity	2.63	0.23	0.62	0.23	0.23
Queue Length 95th (m)	128.6	6.8	0.0	0.0	0.0
Control Delay (s)	872.9	12.8	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	486.0		0.0	0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	69.7		
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	194	982	685	299	0	0
Future Volume (Veh/h)	194	982	685	299	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	211	1067	745	325	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1070				2396	535
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1070				2396	535
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	67				100	100
cM capacity (veh/h)	635				18	485

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	211	1067	497	573	0
Volume Left	211	0	0	0	0
Volume Right	0	0	0	325	0
cSH	635	1700	1700	1700	1700
Volume to Capacity	0.33	0.63	0.29	0.34	0.00
Queue Length 95th (m)	11.0	0.0	0.0	0.0	0.0
Control Delay (s)	13.5	0.0	0.0	0.0	0.0
Lane LOS	B				A
Approach Delay (s)	2.2		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	741	108	98	854	58	0	0	0	41	26	130
Future Volume (Veh/h)	134	741	108	98	854	58	0	0	0	41	26	130
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	146	805	117	107	928	63	0	0	0	45	28	141
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	991			922			1988	2360	864	2329	2388	496
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	991			922			1988	2360	864	2329	2388	496
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	79			85			0	100	100	0	0	73
cM capacity (veh/h)	681			724			0	23	294	14	22	514

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	1068	571	527	214
Volume Left	146	107	0	45
Volume Right	117	0	63	141
cSH	681	724	1700	46
Volume to Capacity	0.21	0.15	0.31	4.70
Queue Length 95th (m)	6.1	3.9	0.0	Err
Control Delay (s)	6.3	3.8	0.0	Err
Lane LOS	A	A		F
Approach Delay (s)	6.3	2.0		Err
Approach LOS				F

Intersection Summary				
Average Delay	902.8			
Intersection Capacity Utilization	102.9%	ICU Level of Service	G	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	28	122	1	8	131
Future Volume (Veh/h)	3	28	122	1	8	131
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	30	133	1	9	142
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	294	134			134	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	294	134			134	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	689	910			1438	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	33	134	151
Volume Left	3	0	9
Volume Right	30	1	0
cSH	884	1700	1438
Volume to Capacity	0.04	0.08	0.01
Queue Length 95th (m)	0.9	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	699	130	186	807	40	116	18	153	34	10	27
Future Volume (Veh/h)	30	699	130	186	807	40	116	18	153	34	10	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	760	141	202	877	43	126	20	166	37	11	29
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	920			901			1774	2220	450	1924	2270	460
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	920			901			1774	2220	450	1924	2270	460
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			73			0	31	70	0	59	95
cM capacity (veh/h)	725			738			26	29	551	10	27	543

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	413	521	640	482	312	77
Volume Left	33	0	202	0	126	37
Volume Right	0	141	0	43	166	29
cSH	725	1700	738	1700	53	18
Volume to Capacity	0.05	0.31	0.27	0.28	5.88	4.29
Queue Length 95th (m)	1.1	0.0	8.5	0.0	Err	Err
Control Delay (s)	1.4	0.0	6.7	0.0	Err	Err
Lane LOS	A		A		F	F
Approach Delay (s)	0.6		3.8		Err	Err
Approach LOS					F	F

Intersection Summary				
Average Delay	1592.8			
Intersection Capacity Utilization	83.3%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	662	58	26	806	77	48	174	5	73	101	135
Future Volume (vph)	165	662	58	26	806	77	48	174	5	73	101	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	1.00		1.00	0.91	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3443			3460		1755	1840		1755	1689	
Flt Permitted		0.64			0.92		0.43	1.00		0.57	1.00	
Satd. Flow (perm)		2221			3179		803	1840		1059	1689	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	720	63	28	876	84	52	189	5	79	110	147
RTOR Reduction (vph)	0	7	0	0	9	0	0	2	0	0	93	0
Lane Group Flow (vph)	0	955	0	0	979	0	52	192	0	79	164	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		33.9			33.9		10.8	10.8		10.8	10.8	
Effective Green, g (s)		33.9			33.9		10.8	10.8		10.8	10.8	
Actuated g/C Ratio		0.64			0.64		0.20	0.20		0.20	0.20	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1428			2044		164	377		217	346	
v/s Ratio Prot								c0.10			0.10	
v/s Ratio Perm		c0.43			0.31		0.06			0.07		
v/c Ratio		0.67			0.48		0.32	0.51		0.36	0.47	
Uniform Delay, d1		5.9			4.8		17.8	18.6		18.0	18.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5			0.8		1.1	1.2		1.0	1.0	
Delay (s)		8.4			5.7		18.9	19.8		19.0	19.5	
Level of Service		A			A		B	B		B	B	
Approach Delay (s)		8.4			5.7			19.6			19.4	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	674	24	73	24	16	18	72	429	35	14	400	748
Future Volume (vph)	674	24	73	24	16	18	72	429	35	14	400	748
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.89		1.00	0.92			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	1.00
Satd. Flow (prot)	1755	1639		1755	1697			3452			3504	1570
Flt Permitted	0.60	1.00		0.69	1.00			0.78			0.93	1.00
Satd. Flow (perm)	1110	1639		1273	1697			2694			3256	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	733	26	79	26	17	20	78	466	38	15	435	813
RTOR Reduction (vph)	0	31	0	0	14	0	0	7	0	0	0	598
Lane Group Flow (vph)	733	74	0	26	23	0	0	575	0	0	450	215
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	42.5	42.5		20.5	20.5			18.5			18.5	18.5
Effective Green, g (s)	42.5	42.5		20.5	20.5			18.5			18.5	18.5
Actuated g/C Ratio	0.61	0.61		0.29	0.29			0.26			0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	835	995		372	496			711			860	414
v/s Ratio Prot	c0.22	0.05			0.01							
v/s Ratio Perm	c0.31			0.02				c0.21			0.14	0.14
v/c Ratio	0.88	0.07		0.07	0.05			0.81			0.52	0.52
Uniform Delay, d1	10.1	5.7		17.9	17.7			24.1			22.0	22.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	10.3	0.1		0.4	0.2			9.6			2.3	4.6
Delay (s)	20.4	5.8		18.2	17.9			33.7			24.3	26.5
Level of Service	C	A		B	B			C			C	C
Approach Delay (s)		18.6			18.0			33.7			25.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	64	128	24	1056	839	23
Future Volume (Veh/h)	64	128	24	1056	839	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	139	26	1148	912	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2124	924	937			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2124	924	937			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	57	96			
cM capacity (veh/h)	52	324	723			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	209	1174	937
Volume Left	70	26	0
Volume Right	139	0	25
cSH	118	723	1700
Volume to Capacity	1.77	0.04	0.55
Queue Length 95th (m)	123.1	0.8	0.0
Control Delay (s)	441.0	1.3	0.0
Lane LOS	F	A	
Approach Delay (s)	441.0	1.3	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	40.4		
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	0	115	0	0	0	98	1022	0	0	747	145
Future Volume (Veh/h)	152	0	115	0	0	0	98	1022	0	0	747	145
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	165	0	125	0	0	0	107	1111	0	0	812	158
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2137	2137	812	2262	2295	1111	970			1111		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2137	2137	812	2262	2295	1111	970			1111		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	67	100	100	100	85			100		
cM capacity (veh/h)	31	41	376	17	33	252	703			621		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	290	0	1218	812	158
Volume Left	165	0	107	0	0
Volume Right	125	0	0	0	158
cSH	51	1700	703	1700	1700
Volume to Capacity	5.65	0.00	0.15	0.48	0.09
Queue Length 95th (m)	Err	0.0	4.1	0.0	0.0
Control Delay (s)	Err	0.0	5.4	0.0	0.0
Lane LOS	F	A	A		
Approach Delay (s)	Err	0.0	5.4	0.0	
Approach LOS	F	A			

Intersection Summary				
Average Delay	1172.8			
Intersection Capacity Utilization	124.0%	ICU Level of Service	H	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	185	148	0	1174	744	0
Future Volume (Veh/h)	185	148	0	1174	744	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	201	161	0	1276	809	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2085	404	809			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2085	404	809			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	73	100			
cM capacity (veh/h)	45	590	800			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	201	161	1276	404	404
Volume Left	201	0	0	0	0
Volume Right	0	161	0	0	0
cSH	45	590	1700	1700	1700
Volume to Capacity	4.52	0.27	0.75	0.24	0.24
Queue Length 95th (m)	Err	8.4	0.0	0.0	0.0
Control Delay (s)	Err	13.4	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	5557.9		0.0	0.0	
Approach LOS	F				

Intersection Summary				
Average Delay	822.2			
Intersection Capacity Utilization	78.7%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	249	1183	717	412	0	0
Future Volume (Veh/h)	249	1183	717	412	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	271	1286	779	448	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1227				2831	614
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1227				2831	614
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	51				100	100
cM capacity (veh/h)	553				7	430

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	271	1286	519	708	0
Volume Left	271	0	0	0	0
Volume Right	0	0	0	448	0
cSH	553	1700	1700	1700	1700
Volume to Capacity	0.49	0.76	0.31	0.42	0.00
Queue Length 95th (m)	20.4	0.0	0.0	0.0	0.0
Control Delay (s)	17.6	0.0	0.0	0.0	0.0
Lane LOS	C				A
Approach Delay (s)	3.1		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	917	120	106	985	64	0	0	0	46	29	143
Future Volume (Veh/h)	147	917	120	106	985	64	0	0	0	46	29	143
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	160	997	130	115	1071	70	0	0	0	50	32	155
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1141			1127			2318	2753	1062	2718	2783	570
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1141			1127			2318	2753	1062	2718	2783	570
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	73			81			0	100	100	0	0	66
cM capacity (veh/h)	597			604			0	11	216	7	11	459

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	1287	650	606	237
Volume Left	160	115	0	50
Volume Right	130	0	70	155
cSH	597	604	1700	22
Volume to Capacity	0.27	0.19	0.36	11.02
Queue Length 95th (m)	8.2	5.3	0.0	Err
Control Delay (s)	10.9	5.0	0.0	Err
Lane LOS	B	A		F
Approach Delay (s)	10.9	2.6		Err
Approach LOS				F

Intersection Summary				
Average Delay	858.6			
Intersection Capacity Utilization	118.9%	ICU Level of Service	H	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	31	134	1	9	144
Future Volume (Veh/h)	4	31	134	1	9	144
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	34	146	1	10	157
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	324	146			147	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	324	146			147	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	96			99	
cM capacity (veh/h)	662	895			1423	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	147	167
Volume Left	4	0	10
Volume Right	34	1	0
cSH	863	1700	1423
Volume to Capacity	0.04	0.09	0.01
Queue Length 95th (m)	1.0	0.0	0.2
Control Delay (s)	9.4	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	834	144	203	967	43	130	20	168	39	11	29
Future Volume (Veh/h)	34	834	144	203	967	43	130	20	168	39	11	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	907	157	221	1051	47	141	22	183	42	12	32
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					401							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	1098			1064			2065	2600	532	2238	2654	549
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	956			1064			1995	2569	532	2181	2629	365
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			65			0	0	62	0	8	95
cM capacity (veh/h)	654			639			5	14	487	0	13	582

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	490	610	746	572	346	86
Volume Left	37	0	221	0	141	42
Volume Right	0	157	0	47	183	32
cSH	654	1700	639	1700	11	0
Volume to Capacity	0.06	0.36	0.35	0.34	32.79	Err
Queue Length 95th (m)	1.4	0.0	11.7	0.0	Err	Err
Control Delay (s)	1.6	0.0	8.8	0.0	Err	Err
Lane LOS	A		A		F	F
Approach Delay (s)	0.7		5.0		Err	Err
Approach LOS					F	F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	94.5%	ICU Level of Service	F	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	807	63	29	960	88	52	193	5	82	111	148
Future Volume (vph)	168	807	63	29	960	88	52	193	5	82	111	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	1.00		1.00	0.91	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3450			3462		1755	1841		1755	1689	
Flt Permitted		0.59			0.90		0.31	1.00		0.46	1.00	
Satd. Flow (perm)		2049			3129		568	1841		844	1689	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	877	68	32	1043	96	57	210	5	89	121	161
RTOR Reduction (vph)	0	5	0	0	8	0	0	2	0	0	69	0
Lane Group Flow (vph)	0	1123	0	0	1163	0	57	213	0	89	213	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		48.1			48.1		13.5	13.5		13.5	13.5	
Effective Green, g (s)		48.1			48.1		13.5	13.5		13.5	13.5	
Actuated g/C Ratio		0.69			0.69		0.19	0.19		0.19	0.19	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1416			2162		110	357		163	327	
v/s Ratio Prot								0.12			c0.13	
v/s Ratio Perm		c0.55			0.37		0.10			0.11		
v/c Ratio		0.79			0.54		0.52	0.60		0.55	0.65	
Uniform Delay, d1		7.3			5.3		25.1	25.6		25.3	25.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.6			1.0		4.1	2.7		3.7	4.6	
Delay (s)		12.0			6.3		29.2	28.3		29.0	30.5	
Level of Service		B			A		C	C		C	C	
Approach Delay (s)		12.0			6.3			28.5			30.1	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	766	28	81	26	25	20	82	471	38	15	439	906
Future Volume (vph)	766	28	81	26	25	20	82	471	38	15	439	906
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.89		1.00	0.93			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	1.00
Satd. Flow (prot)	1755	1641		1755	1723			3452			3504	1570
Flt Permitted	0.59	1.00		0.68	1.00			0.73			0.93	1.00
Satd. Flow (perm)	1088	1641		1258	1723			2545			3248	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	833	30	88	28	27	22	89	512	41	16	477	985
RTOR Reduction (vph)	0	36	0	0	17	0	0	6	0	0	0	684
Lane Group Flow (vph)	833	82	0	28	32	0	0	636	0	0	493	301
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	53.5	53.5		19.5	19.5			27.5			27.5	27.5
Effective Green, g (s)	53.5	53.5		19.5	19.5			27.5			27.5	27.5
Actuated g/C Ratio	0.59	0.59		0.22	0.22			0.31			0.31	0.31
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	865	975		272	373			777			992	479
v/s Ratio Prot	c0.32	0.05			0.02							
v/s Ratio Perm	c0.26			0.02				c0.25			0.15	0.19
v/c Ratio	0.96	0.08		0.10	0.09			0.82			0.50	0.63
Uniform Delay, d1	15.0	7.8		28.2	28.1			28.9			25.6	26.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	21.9	0.2		0.8	0.4			9.4			1.8	6.1
Delay (s)	36.9	8.0		29.0	28.6			38.3			27.4	33.0
Level of Service	D	A		C	C			D			C	C
Approach Delay (s)		33.3			28.7			38.3			31.1	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix E:
Study Commencement

Summary of Stakeholder Consultation

The following is a listing of stakeholder consultation events and their associated timelines.

EVENT	DATE
Notice of Study Commencement	July 11, 2019
Notice of Public Information Centre 1	January 23, 2020
Public Information Centre 1	February 6, 2020
Notice of Public Information Centre 2	September 23, 2020[1] October 16, 2020[2]
Public Information Centre 2 (on-line engagement)	Sept 24 to Oct 8, 2020 Extended to Nov 1, 2020[3]
Notice of Study Completion	January 29, 2021
30-Day Review Period for Final Report	Feb 3 to March 5, 2021

Notes

1. initial notification for PIC 2 was issued on September 23, 2020 via newspaper, posted on the Town's website, circulation to review agencies and emailed to the circulation list
2. direct mailings were issued on October 16, 2020 to all properties fronting the subject lengths of Main Street, Mosley Street, Beach Drive, River Avenue Crescent and Glenwood Drive
3. following the direct mailings, the PIC 2 on-line engagement was extended to November 1, 2020

Main Street Reconstruction & Downtown Revitalization
Municipal Class Environmental Assessment Study
Notice of Study Commencement

Background

The Town of Wasaga Beach is proposing improvements to the Main Street (River Road West to Mosley Street), Mosley Street (Main Street to 6th Street) and Beach Road corridors. The improvements are necessary to facilitate and support future growth within the study area and ensure that future transportation and infrastructure demands can be accommodated. The Environmental Assessment will identify various alternatives to implementing the needed improvements, with consideration given to road widening, intersection improvements, roundabouts and pedestrian and cycling facilities. Infrastructure improvements will also be considered in context of the Town's servicing strategy and associated infrastructure requirements.

Study Process

The Town is proceeding with a Schedule C Municipal Class Environmental Assessment (EA) to consider the impacts associated with the proposed improvements. The Class EA process will address the following:

- the existing operations and conditions along Main Street and through the beachfront area;
- alternative solutions to implementing the improvements and addressing the identified future needs;
- the location, extent and sensitivity of the existing environments within the area;
- the potential impacts of each alternative to the noted environments and possible mitigating measures;
- public and agency consultation and participation; and
- an assessment and evaluation of the alternatives culminating in a preferred solution.

Purpose of Notice

The purpose of this notice is to invite public/agency input and comment early in the study such that they can be incorporated into the planning and overall study design. Comments should be directed to the Town and/or Consultant as noted below. A further opportunity for public input and comment will be provided at a Public Information Centre (open house) to be held in the upcoming months, during which time the various alternative solutions and assessment of each will be presented. Further details with respect to the Public Information Centre will be provided closer to the date.

Project Contacts

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Consultant
Tatham Engineering Ltd.
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Collingwood, ON L9Y 5A6
Michael Cullip, P.Eng
Project Manager
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(705) 444-2565 x2020

This notice issued July 11, 2019

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Agency	Ministry of the Environment, Conservation & Parks	Barrie District Office	54 Cedar Pointe Dr. Unit 1201	Barrie, Ontario	L4N 5R7	Cindy	Hood	Ms.	Manager	705-309-5874	cindy.hood@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Central Region Office	Place Nouveau 5775 Yonge Street, 9th Floor	Toronto, Ontario	M2M 4J1	Chunmei	Liu	Ms.	EA Coordinator	416-326-4886	chunmei.lui@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Environmental Assessment Services	135 St. Clair Ave. W. 1st Floor	Toronto, Ontario	M4V 1P5	Annamaria	Cross	Ms.	Manager	416-314-7967	Annamaria.cross@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Southwest Zone	1350 High Falls Road	Bracebridge	P1L 1W9	Meghan	Pomeroy	Ms.	Park Planner – Southwest Zone	705-646-5520	Meghan.Pomeroy@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Midhurst District Office	2284 Nursery Road	Midhurst, Ontario	L0L 1X0	Chantale	Gagnon	Ms.	Regional Advisor	705-241-2386	chantale.gagnon@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Heritage Planning Unit	401 Bay Street Suite 1701	Toronto, Ontario	M7A 0A7	Dan	Minkin	Mr.	Heritage Planner	416-314-7147	dan.minkin@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Archaeology Program Unit	401 Bay Street Suite 1700	Toronto, Ontario	M7A 0A7	Katherine	Cappella	Ms.	Manager	416-314-7132	katherine.cappella@ontario.ca
Agency	Ministry of Natural Resources & Forestry	Midhurst District	2284 Nursery Road	Midhurst, Ontario	L0L 1X0	Ken	Mott	Mr.	District Planner	705-725-7546	ken.mott@ontario.ca
Agency	Ministry of Natural Resources & Forestry	Wasaga Beach Provincial Park	11 22nd Street	Wasaga Beach, Ontario	L9Z 2V9	John	Fisher	Mr.	Park Superintendent		john.fisher@ontario.ca
Agency	Ministry of Municipal Affairs and Housing	Central Municipal Services Office	777 Bay Street 13th Floor	Toronto, Ontario	M5G 2E5	Aly	N. Alibhai	Mr.	Regional Director	416-585-7264	aly.alibhai@ontario.ca
Agency	Ministry of Agriculture, Food & Rural Affairs	OMAFRA Land-Use Policy & Stewardship	1 Stone Rd W. 3rd Floor	Guelph, Ontario	N1G 4Y2	John	Turvey	Mr.	Policy Advisor	519-766-8811	john.turvey@ontario.ca
Agency	Ministry of Transportation	Central Region, Planning & Design	159 Sir William Hearst Avenue, Bldg. “D”, 7th Floor	Toronto, Ontario	M3M 0B7	John	Mackinnon	Mr.	Area Manager	416-235-5533	john.mackinnon@ontario.ca
Agency	Ministry of Indigenous Affairs	Indigenous Relations Branch	160 Bloor Street E. Suite 400	Toronto, Ontario	M7A 2E6	Francois	Lachance	Mr.	Senior Advisor	416-326-4754	francois.lachance@ontario.ca

Last Updated: September 23, 2020

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Agency	Nottawasaga Valley Conservation Authority	John Hix Conservation Administration Centre	8195 8th Line	Utopia, Ontario	L0M 1T0	Doug	Hevenor	Mr.	Chief Administrative Officer	705-424-1479 ext. 225	dhevenor@nvca.on.ca
Agency	Lake Simcoe Region Conservation Authority		120 Bayview Parkway	Newmarket, Ontario	L3Y 3W3	Ben	Longstaff	Mr.	General Manager, Integrated Watershed Management	905-895-1281 ext. 305	b.longstaff@lsrca.on.ca
Agency	Simcoe Muskoka District Health Unit	15 Sperling Drive		Barrie, Ontario	L4M 6K9					705-721-7520	
Agency	Infrastructure Ontario	Realty Operations & Asset Management	1 Dundas Street West Suite 2000	Toronto, Ontario	M5G 1Z3	Sean	Wiley	Mr.	Executive Vice-President, Asset Management	416-327-3937	sean.wiley@infrastructureontario.ca
Agency	Infrastructure Ontario	Environmental Management				Cory	Ostrowka	Mr.			Cory.Ostrowka@infrastructureontario.ca
Agency (Federal)	Crown-Indigenous Relations & Northern Affairs Canada	Lands & Economic Development - Environment	655 Bay Street, Suite 700 8th Floor	Toronto, Ontario	M5G 2K4	Sunil	Bajaj	Mr.	Manager	416-973-4614	sunil.bajaj@canada.ca
Agency (Federal)	Department of Fisheries and Oceans	Fish & Fish Habitat Protection Program	867 Lakeshore Road	Burlington, Ontario	L7S 1A1	Tom	Hoggarth	Mr.	Regional Director, Ecosystems Management	905-336-4764	
Agency	Ontario Provincial Police	Huronia West Detachment	P.O. Box 140 1000 River Road West	Wasaga Beach, Ontario	L9Z 1A1						
Municipal	The County of Simcoe	Administration Centre	1110 Highway 26	Midhurst, Ontario	L9X 1N6	Mark	Aitkin	Mr.	Chief Administrative Officer	705-726-9300 ext.1260	cao@simcoe.ca
School Board	Simcoe County District School Board		1170 Highway 26	Midhurst, Ontario	L9X 1N6	Andrew	Keuken	Mr.	Manager of Planning, Enrolment & Community Use	705-734-6363 ext. 11513	akeuken@scdsb.on.ca
School Board	Simcoe Muskoka Catholic District School Board	46 Alliance Blvd.		Barrie, Ontario	L4M 5K3	Christine	Hyde	Ms.	Manager of Planning & Development	705-722-3555 ext. 351 (?)	chyde@smcdsb.on.ca
School Board	Simcoe County Student Transportation Consortium	64 Cedar Pointe Drive Suite 1403		Barrie, Ontario	L4N 5R7	Bonnie	Branch	Ms.	Transportation Coordinator	705-733-8965	bbranch@scstc.ca
Utility	Bell Canada	136 Bayfield Street	Floor 2	Barrie, Ontario	L4M 3B1	Andrew	Fournier	Mr.	Manager, Access Network	705-722-2677	andrew.fournier@bell.ca
Utility	Rogers Cable Systems	1 Sperling Drive	P.O. Box 8500	Barrie, Ontario	L4M 6B8	Tony	Dominguez	Mr.	Systems Planner	705-737-4660	tony.dominguez@rci.rogers.com

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Utility	Hydro One	Subdivision Group	420 Welham Road	Barrie, Ontario	L4N 8Z2	Heather	McTeer	Ms.			
Utility	Hydro One Network	45 Sarjeant Drive	P.O. Box 6700	Barrie, Ontario	L4M 5N5	Business Customer Centre					
Utility	Ontario Power Generation	700 University Avenue		Toronto, Ontario	M5G 1X6	Christopher F.	Ginther	Ms.	Chief Administrative Officer	416-592-2555	
Utility	Wasaga Distribution Inc.	P.O. Box 20	950 River Road West	Wasaga Beach, Ontario	L9Z 1A1						
Utility	Enbridge Gas Distribution Inc.	10 Churchill Dr.		Barrie, Ontario	L4N 8Z5	David	Smith	Mr.	Sales Development Representative	705-739-5254	
Utility	Union Gas	1590 8th Street East		Owen Sound, Ontario	N4K 0A2	Derrick	Cunningham	Mr.			
First Nations Community	Chippewas of Georgina Island	R. R. #2	P.O. Box N-13	Sutton West, ON	LOE 1RO	Donna	Big Canoe	Ms.	Chief	705 437-1337	
First Nations Community	Chippewas of Rama First Nation	5884 Rama Road	Suite 200	Rama, Ontario	L3V 6H6	Rodney	Noganosh		Chief	705-325-3611	
First Nations Community	Wahta Mohawk	P.O. Box 260	2664 Muskoka Road 38	Bala, Ontario	P0C 1A0	Philip	Franks		Chief	705-762-2354	
First Nations Community	Moose Dear Point	3719 Twelve Mile Bay Road	P.O. Box 119	Mac Tier, Ontario	P0C 1H0	Barron	King		Chief	705-375-5209	
First Nations Community	Wasauksing First Nation	P.O. Box 250	1508 Geewadin Road	Parry Sound, Ontario	P2A 2X4	Warren	Tabobondung		Chief	705-746-2531	
First Nations Community	Coordinator for Williams Treaties First Nation	8 Creswick Court		Barrie, Ontario	L4M 2J7	Karry	Sandy-McKenzie	Ms.	Barrister & Solicitor		inquiries@williamstreatiesfirstnations.ca
First Nations Community	Beausoleil First Nation (Christian Island)	11 O'Gemaa Miikaan		Christian Island, Ontario	L9M 0A9	Guy	Monague		Chief	705-247-2051	
First Nations Community	Georgian Bay Métis Council	355 Cranston Crescent	PO Box 4	Midland, Ontario	L4R 4K6	Greg	Garratt	Mr.	President	705-526-6335	greggarratt@gmail.com
First Nations Community	Moon River Métis Council		385a Bethune Drive North	Gravenhurst, Ontario	P1P 1B8	Tony	Muscat	Mr.	President		
First Nations Community	Métis Nation of Ontario - Head Office	66 Slater Street	Suite 1100	Ottawa, Ontario	K1P 5H1						

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Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
First Nations Community	La Nation Huronne-Wendat (Huron-Wendat First Nation)	Centre Administratif	255 Place Chef Michel Laveau	Wendake, Quebec	G0A 4V0	Konrad H.	Sioui		Grand Chief	418-843-3767	

Last Updated: September 23, 2020

Ministry of the Environment, Conservation and Parks
Drinking Water and Environmental Compliance Division
Central Region

5775 Yonge Street, 8th floor
North York ON M2M 4J1
Tel.: 416 326-6700
Fax.: 416 325-6345

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Division de la conformité en matière d'eau potable et d'environnement
Région du Centre

8e étage, 5775, rue Yonge
North York ON M2M 4J1
Tél. : 416 326-6700
Téléc. : 416 325-6345

Ontario

February 20, 2020 File No.: EA 01-06-05

Mike Latimer, C.E.
Project Coordinator
Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, ON L9Z 1A1
m.latimer@wasagabeach.com

BY EMAIL ONLY

Re: **Main Street Reconstruction & Downtown Revitalization**
Town of Wasaga Beach
Schedule C Municipal Class EA
Response to Notice of Commencement

Dear Mr. Latimer,

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the Town of Wasaga Beach has indicated that the study is following the approved environmental planning process for a Schedule C project under the Municipal Class Environmental Assessment (Class EA).

The attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please identify the areas of interest which are applicable to the project and ensure they are addressed. Proponents who address all of the applicable areas of interest can minimize potential delays to the project schedule.

An Air Quality Impact Assessment (AQIA) may be required to be included in the report and used as part of the decision-making process to address all potential air quality impacts to current and future sensitive receptors. This AQIA should include at a minimum the predicted traffic flows and the current and future emissions estimates, as well as any required mitigation measures. General guidance regarding the scope of AQIA requirements for Schedule C road improvement Municipal Class EA ESRs is attached to this letter for your reference. Please contact this office to determine potential AQIA requirements for this project.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before the proponent may proceed with this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in

relation to the proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown`s preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

- Chippewas of Georgina Island
- Chippewas of Rama First Nation (Chippewas of Mnjikaning)
- Beausoleil First Nation
- Huron-Wendat Nation, if there is potential for the project to impact archeological resources
- Saugeen Ojibway Nation (Saugeen First Nation and Chippewas of Nawash Unceded First Nation)
- Métis Nation of Ontario

Nothing in the above guidance should prevent the Town from reaching out to other Indigenous communities and/or organization which it understands may have an interest in the study, including those Indigenous communities and organizations that it notified during the Class EA study.

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link: https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process
Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments

Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information.

The proponent must contact the Director of Environmental Assessment and Permissions Branch under the following circumstances subsequent to initial discussions with the communities identified by MECP:

- Aboriginal or treaty rights impacts are identified to the proponent by the communities;
- The proponent has reason to believe that the proposed project may adversely affect an Aboriginal or treaty right;
- Consultation has reached an impasse;
- A Part II Order request or elevation request is expected.

The Director can be notified either by email, mail or fax using the information provided below:

Email:	enviropermissions@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Assessment and Permissions Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role the proponent will be asked to play should additional steps and activities be required.

A Part II Order Request Form must be used to request a Part II Order. The Part II Order Request Form is available online on the Forms Repository website (http://www.forms.ssb.gov.on.ca/) by

searching “Part II Order” or “012-2206E” (the form ID number). Please include reference to this in the Notice of Completion for this project.

Please note that there is a new long-term temporary address for the Minister of the Environment, Conservation and Parks. The new address is as follows:

Office of the Minister of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
Tel.: 416-314-6790
minister.mecp@ontario.ca

A draft copy of the ESR should be sent to this office prior to the filing of the final report, allowing a minimum of 30 days for the ministry’s technical reviewers to provide comments. Please also forward the Notice of Completion and final ESR to us when completed.

Should you or any members of your project team have any questions regarding the material above, please contact me at Chunmei.Liu@ontario.ca or 416-326-4886.

Yours truly,

Chunmei Liu
Regional Environmental Assessment Coordinator
Air, Pesticides and Environmental Planning

cc: Paul Martin, Supervisor, Technical Support Section, MECP
Cindy Hood, Manager, Barrie District Office, MECP
Michael Cullip, Project Manager, Tatham Engineering Ltd.
Central Region EA File
A & P File

Attach: Areas of Interest
A Proponent’s Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities
Air Quality Impact Assessment Guidance for Municipal Road Class EAs

AREAS OF INTEREST

It is suggested that you check off each applicable area after you have considered / addressed it.

☐ **Species at Risk**

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. For any questions related to subsequent permit requirements, you may contact SAROntario@ontario.ca.

☐ **Planning and Policy**

- Parts of the study area may be subject to the A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2019), Oak Ridges Moraine Conservation Plan (2017), Niagara Escarpment Plan (2017), Greenbelt Plan (2017) or Lake Simcoe Protection Plan (2014). Applicable policies should be referenced in the Project File/ESR, and the proponent should describe how the proposed study adheres to the relevant policies in these plans.

- The Provincial Policy Statement (2014) contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the Project File/ESR, and the **proponent should describe how this proposed project is consistent with these policies.**

☐ **Source Water Protection (all projects)**

The Clean Water Act, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e. systems that are not municipal residential systems). MEA Class EA projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the Project File/ESR on source water protection.**
    - The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.
    - If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the Project File/ESR how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.

- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.

- **In order to determine if this project is occurring within a vulnerable area, proponents can use this mapping tool: http://www.applications.ene.gov.on.ca/swp/en/index.php. Use the "Map Legend" on the left side to turn on various layers (including Highly Vulnerable Aquifer and Significant Groundwater Recharge Area under Water Quality Layers). The mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.**

- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. The contact for this project is Jennifer Stephens at jstephens@trca.on.ca. Please document the results of that consultation within the Report and include all communication documents/correspondence.**

More Information
For more information on the Clean Water Act, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to Conservation Ontario's website where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in section 1.1 of Ontario Regulation 287/07 made under the Clean Water Act. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

Climate Change

A guide has now been finalized: "Considering Climate Change in the Environmental Assessment Process" (Guide), which is found online at: https://www.ontario.ca/page/considering-climate-change-environmental-assessment-process

The Guide is now a part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the ministry's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. Please review this Guide in detail.

- We expect proponents to:
  1. Take into account during the assessment of alternative solutions and alternative designs, the following:
     a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
     b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
  2. Include a discrete section in the Project File/ESR detailing how climate change was considered in the EA.

  How climate change is considered can be qualitative or quantitative in nature, and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered. **Please ensure climate change is considered in the report.**

- The ministry has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "Community Emissions Reduction Planning: A Guide for Municipalities" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on methods and techniques to incorporate consideration of energy and greenhouse gas emissions into municipal activities of all types. We encourage you to review the Guide for information.

Air Quality, Dust and Noise

- If there are sensitive receptors in the surrounding area of this project, an air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern. **Please contact this office for further consultation on the level of Air Quality Impact Assessment required for this project if not already advised.**

- If a quantitative Air Quality Impact Assessment is not required for the project, the Project File/ESR should still contain:
  - A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
  - A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
  - A discussion of local air quality impacts that could arise from this project during both construction and operation; and
  - A discussion of potential mitigation measures.

- Assessments for NOx emissions from diesel generators are required for permitting of municipal residential water systems. If the new pumping station will have a diesel generator system for standby power, please include the NOx POI assessment as supporting documentation for the EA.

- As a common practice, "air quality" should be used an evaluation criterion for all road projects.

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.

- The ministry recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities.* Report prepared for Environment Canada. March 2005.http://www.bv.transports.gouv.qc.ca/mono/1173259.pdf

- The Project File/ESR should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The Project File/ESR should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

- All natural heritage features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:

  - Areas of Natural and Scientific Interest (ANSIs)
  - Rare Species of flora or fauna
  - Watercourses
  - Wetlands
  - Woodlots

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, you may consider the provisions of the Rouge Park Management Plan if applicable.

Surface Water

- The Project File/ESR must include a sufficient level of information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.

- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's Stormwater Management Planning and Design Manual (2003) should be referenced in the Project File/ESR and utilized when designing stormwater control methods. **A Stormwater Management Plan should be prepared as part of the Class EA process** that includes:

    - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
    - Watershed information, drainage conditions, and other relevant background information
    - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
    - Information on maintenance and monitoring commitments.

- Ontario Regulation 60/08 under the Ontario Water Resources Act (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If the proposed sewage treatment plant is listed in Table 1 of the regulation, the Project File/ESR should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.

- Any potential approval requirements for surface water taking or discharge should be identified in the Project File/ESR. In particular, a Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information. Additionally, an Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.

Groundwater

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the Project File/ESR.

- If the potential construction or decommissioning of water wells is identified as an issue, the Project File/ESR should refer to Ontario Regulation 903, Wells, under the OWRA.

- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

- Any potential approval requirements for groundwater taking or discharge should be identified in the Project File/ESR. In particular, a Permit to Take Water (PTTW) under the OWRA will be required for any water

takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information.

Contaminated Soils

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the ministry's District Offices for further consultation if contaminated sites are present.

- Any current or historical waste disposal sites should be identified in the Project File/ESR. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites.

- The location of any underground storage tanks should be investigated in the Project File/ESR. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.

- The Project File/ESR should identify any underground transmission lines in the study area. The owners should be consulted to avoid impacts to this infrastructure, including potential spills.

Excess Materials Management

- Activities involving the management of excess soil should be completed in accordance with the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014) available online (http://www.ontario.ca/document/management-excess-soil-guide-best-management-practices).

- All waste generated during construction must be disposed of in accordance with ministry requirements.

Servicing and Facilities

- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with the Environmental Assessment and Permissions Branch to determine whether a new or amended ECA will be required for any proposed infrastructure.

- We recommend referring to the ministry's "D-Series" guidelines – Land Use Compatibility to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

Mitigation and Monitoring

Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the Project File/ESR and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.

- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

- The proponent's construction and post-construction monitoring plans must be documented in the Project

File/ESR, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

Consultation

- The Project File/ESR must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the Project File/ESR that identifies concerns that were raised and **describes how they have been addressed by the proponent** throughout the planning process. The Class EA also directs proponents to include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments.

Class EA Process

- The Project File/ESR should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.

- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. The Master Plan should clearly indicate the selected approach for conducting the plan, in particular by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Part II Order Requests under the *Environmental Assessment Act* (EAA), although the plan itself would not be.

- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment. The Project File/ESR should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments) such that all potential impacts can be identified and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the Project File/ESR.

- Please include in the Project File/ESR a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations and ECAs, conservation authority permits, species at risk permits, and approvals under the *Canadian Environmental Assessment Act* (CEAA).

- Ministry guidelines and other information related to the issues above are available at http://www.ontario.ca/environment-and-energy/environment-and-energy. We encourage you to review all the available guides and to reference any relevant information in the Project File/ESR.

DEFINITIONS

The following definitions are specific to this document and may not apply in other contexts:

Aboriginal communities – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

Consultation – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

Crown – the Ontario Crown, acting through a particular ministry or ministries.

Procedural aspects of consultation – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

Proponent – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

I. PURPOSE

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

II. WHY IS IT NECESSARY TO CONSULT WITH ABORIGINAL COMMUNITIES?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

III. THE CROWN'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;
- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

IV. THE PROPONENT'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

a) What might a proponent be required to do in carrying out the procedural aspects of consultation?

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;

- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;
- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

b) What documentation and reporting does the Crown need from the proponent?

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;
- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;
- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;
- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

V. WHAT ARE THE ROLES AND RESPONSIBILITIES OF ABORIGINAL COMMUNITIES' IN THE CONSULTATION PROCESS?

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant documentation;
- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigates any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

VI. WHAT IF MORE THAN ONE PROVINCIAL CROWN MINISTRY IS INVOLVED IN APPROVING A PROPONENT'S PROJECT?

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

Air Quality Impact Assessment Guidance for Municipal Road Class EAs

1. Study Area

   The scope of the AQIA should be determined by the proponent and clearly outlined in the AQIA document based on the number and nature of scenarios/alternatives being considered, for example, the routes under consideration.

   The focus should be on defining the "worst case scenario", whether it is the length of roadway with the highest traffic volumes in close proximity to sensitive receptors or sections of roadways with on and off ramps and overpasses. The end result should be a defined study area.

2. List of Parameters

   The list of parameters should focus mainly on the key pollutants released from mobile sources such as, but not limited to, the following:
   - CO
   - NO_x (with a focus on NO and NO_2)
   - TSP
   - PM_{10}
   - $PM_{2.5}$
   - Selected VOCs (benzene, 1-3 Butadiene, formaldehyde, acetaldehyde and acrolein)
   - Benzo(a)pyrene – as a surrogate for PAHs

   All averaging periods for which there is a corresponding standard or guideline should be assessed.

3. Background Data

   Background data representative of the study area is generally summarized for the most recent 5 years from the nearest or most representative MOECC AQHI and/or NAPS stations. The 90^{th} percentile should be used when assessing combined air quality concentrations for comparison against applicable standards and guidelines.

4. Emission Estimates

   Emission estimates are based on current and proposed future traffic counts where MOVES is used to generate emission factors.

5. Traffic Data

   Traffic data including fleet distribution and characteristics, road type, traffic signals, idling conditions, or roundabouts/stop signs may be considered or incorporated into the assessment.

6. Dispersion Modelling and Meteorological Data

   Dispersion modelling, typically using CAL3QHCR or AERMOD, is conducted to determine maximum pollutant concentrations resulting from implementation of the project and the resulting air quality impacts at the most impacted sensitive receptors for the different scenarios. At a minimum, two modelling scenarios are to be conducted to determine the incremental difference between the current conditions (base case) and future scenario. The timing of the future scenario should be defined and take into consideration projected population growth and traffic/emissions impacts.

   According to the Ministry of Transportations' *Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (June, 2012)*, "…local air quality impacts are assumed to be limited to a distance of approximately 500 m from the transportation facility, in each direction." Therefore, the Cartesian grid system used to easily model concentrations at each receptor typically has a grid limit of approximately 500 m from the edge of the subject road.

   The five most recent years of meteorological data should be used for dispersion modelling. However,

under certain conditions, one year of continuous data may be sufficient. Surface data can be obtained from facilities such as Pearson International Airport, Toronto Island, Buttonville or site-specific and upper air data obtained from Buffalo, New York.

All supporting documentation and assumptions that are inputted into the models should be summarized as appendices. A sample of the electronic dispersion model input and output files must be submitted for the ministry's review.

7. Sensitive Receptors

All key and potentially sensitive receptors located in the surrounding area must be identified and included in the model. Sensitive receptors include but are not limited to residences, schools, health care facilities and daycare centers. Future sensitive receptors should also be included in the assessment.

8. Combined Effects

In order to assess the combined effects at nearby sensitive receptors, the AQIA should sum the maximum modelled concentrations with the 90th percentile background concentrations for comparison against applicable standards and guidelines.

If exceedances or non-conformances are predicted, a discussion of possible mitigation measures should be included.

9. Applicable Guidelines

Applicable standards and guidelines may include:

- MOECC Ambient Air Quality Criteria (AAQCs)
- Canadian Ambient Air Quality Standards (CAAQs)

10. Results

The predicted results obtained from the dispersion modelling exercise are to be presented in detail in the AQIA and summarized in the ESR. This should include an analysis and discussion of the results and potential air quality impacts of the project.

Results for each contaminant should be discussed separately and should depict predicted maximum concentrations at the most impacted sensitive receptor(s), the overall maximum predicted concentrations and the combined concentrations, for each averaging period assessed. It may also be relevant to discuss receptor specific results.

11. Climate Change and Regional Impacts

The AQIA should consider climate change and regional air quality impacts when assessing the project's potential impacts and possible mitigation measures. This may include comparing impacts from the proposed undertaking with the provincial greenhouse gas totals reported by Environment Canada.

12. Summary and Mitigation Measures

The AQIA and ESR should summarize the key conclusions of the study based on the results as provided. In addition, general mitigation measures should be discussed, including those mitigation measures that will be implemented during construction to minimize off-site impacts.

For example, best management practices should be applied to mitigate any air quality impacts caused by construction dust. Please note that the ministry recommends that non-chloride dust suppressants be applied.

For a comprehensive list of fugitive dust prevention and control measures, please refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities.* Report prepared for Environment Canada. March 2005. http://www.bv.transports.gouv.qc.ca/mono/1173259.pdf

13. Cumulative Impacts

The ministry is currently preparing draft guidance documents to address cumulative effects in EAs. In the interim, please use the following federal EA resources as references for addressing cumulative effects:

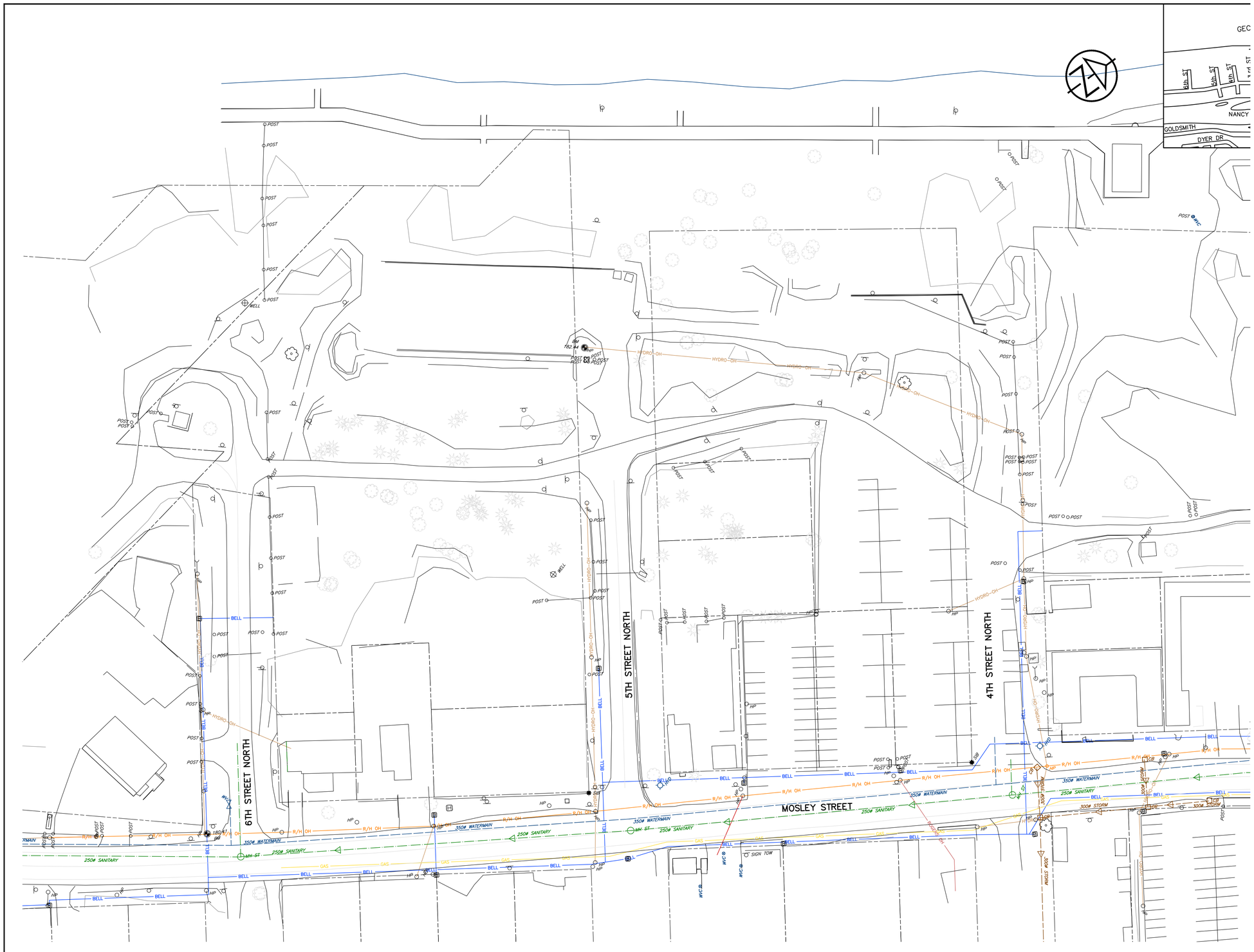
- Cumulative Effects Assessment Practitioners' Guide
  https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=43952694-%201&offset=&toc=hide

- Reference Guide: Addressing Cumulative Environmental Effects
  https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=9742C481-%201&offset=&toc=hide

14. Further Guidance

For further guidance, including additional references and information such as prediction of emissions from re-entrained road dust and silt loading factors, please refer to the Ministry of Transportations' *Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (June, 2012) or any subsequent version.* http://www.raqsb.mto.gov.on.ca/techpubs/eps.nsf/0/24FE4BB174A2AF7085257AA9006558F4?opendocument

Appendix F:
Utility Master Plan



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SEWER AND WATERMAIN INFORMATION BASED ON THE TOWN GIS MODEL AND AS-BUILT INFORMATION PROVIDED BY THE TOWN.

LEGAL LINES BASED ON THE TOWN GIS MODEL.

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PRELIMINARY

BEACH AREA 1 & 2 UTILITY MASTER PLAN

TOWN OF WASAGA BEACH

EXISTING UTILITY PLAN SHEET 1 OF 3

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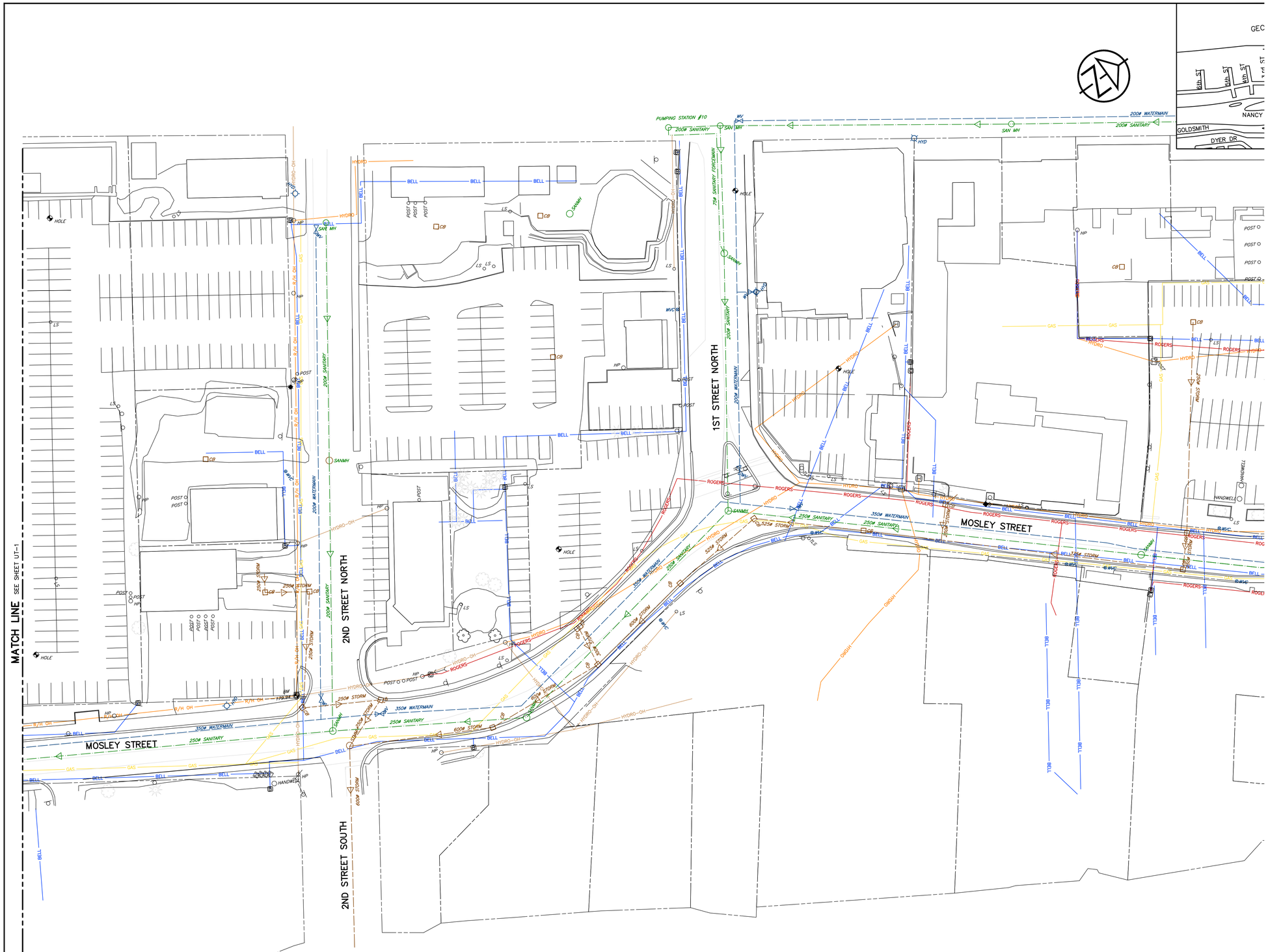

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PRELIMINARY

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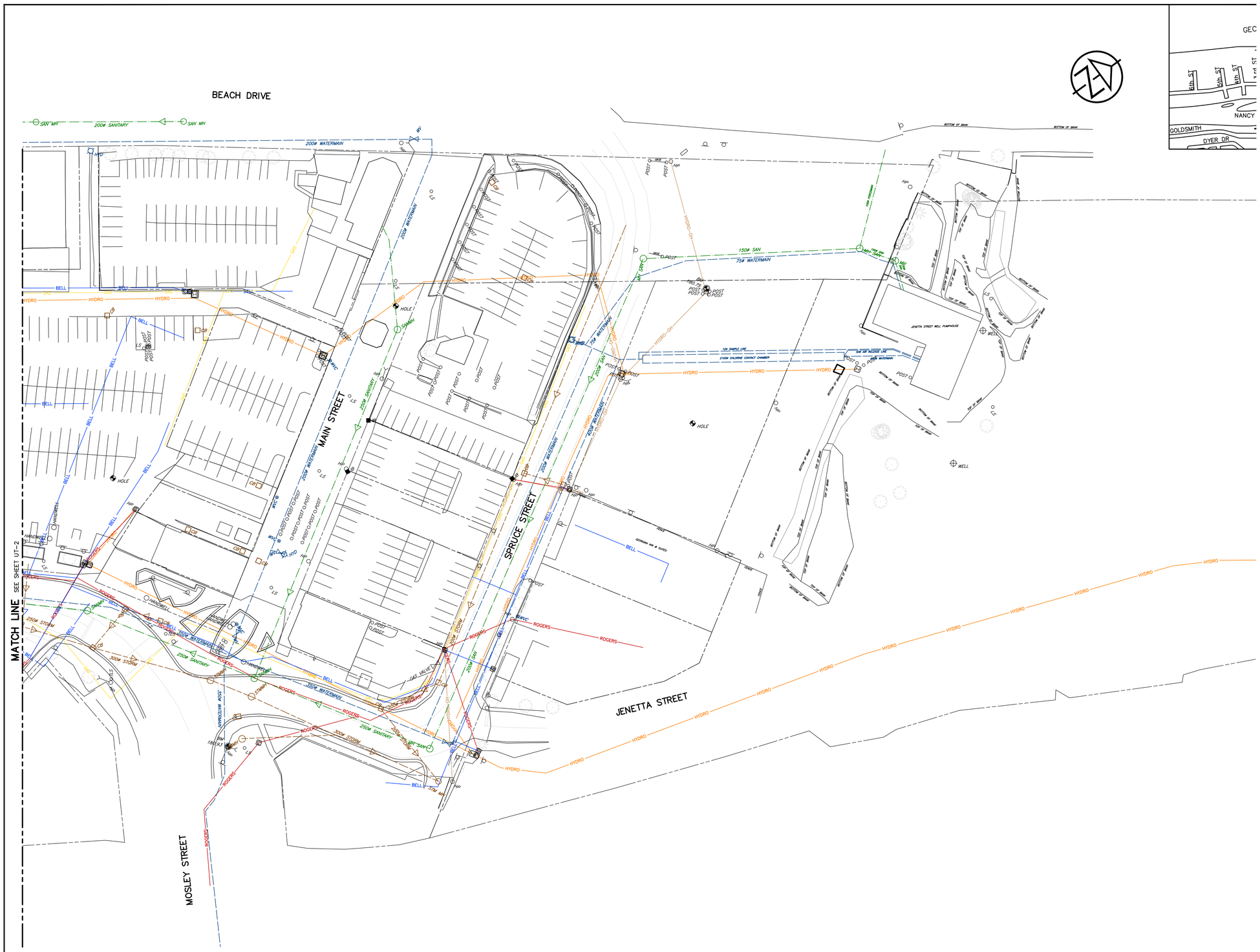
TOWN OF WASAGA BEACH

EXISTING UTILITY PLAN
SHEET 2 OF 3

Drawing Name: 119067-UT01.dwg, Plotted: Nov 17, 2020



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BEACH AREA 1 & 2 UTILITY MASTER PLAN

TOWN OF WASAGA BEACH

EXISTING UTILITY PLAN SHEET 3 OF 3

Drawing Name: 119067-UT01.dwg, Plotted: Nov 17, 2020

Appendix G:
Natural Environment Reports

Natural Heritage Existing Conditions and Preliminary Constraints Report

Main Street Revitalization Municipal Class EA
Town of Wasaga Beach

Prepared for:
Tatham Engineering Ltd.

Prepared by:
Azimuth Environmental
Consulting, Inc.

December 2019

AEC 18-351

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

December 20, 2019 AEC 18-351

Tatham Engineering Ltd.
115 Sanford Fleming Drive, Suite 200
Collingwood, Ontario
L9Y 5A6

Attention: Michael Cullip, B.Eng. & Mgmt., M.Eng., P.Eng., Director, Manager - Transportation & Municipal Engineering

Re: **Natural Heritage Existing Conditions and Preliminary Constraints Report - Municipal Class Environmental Assessment Schedule C, Main Street Reconstruction and Downtown Revitalization**

Dear Mr. Cullip:

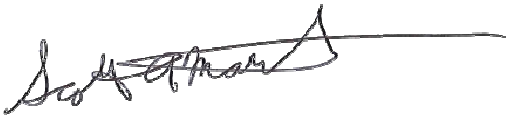
Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to submit our Natural Heritage Existing Conditions and Preliminary Constraints Report for the above-noted project. It is our understanding that the Town of Wasaga Beach is proceeding with a Schedule C Municipal Class Environmental Assessment (Class EA) to consider the impacts associated with the proposed reconstruction of Main Street and revitalization of Beach 1 and 2. This study forms a portion of the "environmental impact" work towards the Class EA.

This report summarizes field and desktop investigations undertaken in fall 2019 to characterize the natural environmental features in the study area and surrounding lands to assist in the evaluation of alternative design concepts and solutions. The assessment was designed to evaluate the study area for features and species with potential to pose as constraints on the proposed project based on applicable policy and/or legislation. This report has been prepared based on our understanding of the proposed work area at this time.

Should you have any questions or wish to discuss the information provided, please do not hesitate to contact us.

Yours truly,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.



Scott Martin, B.Sc.
Terrestrial Ecologist

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1.0 INTRODUCTION

The Town of Wasaga Beach is proposing improvements to Main Street from River Road West to Mosley Street; Mosley Street from Main Street to 6th Street; and Beach Road corridors. Azimuth Environmental Consulting, Inc. (Azimuth) was retained as a sub-consultant to Tatham Engineering Ltd. (Tatham) to complete a scoped Environmental Impact Study (EIS) for the proposed works to Main Street and downtown Wasaga Beach (study area; Figure 1).

It is our understanding that work is being completed in accordance with a Schedule 'C' Municipal Class Environmental Assessment (Class EA) undertaking, and that the town is proceeding with an EIS to determine and assess the potential impacts of the proposed road works on possible Significant Natural Heritage Features (SNHF) and functions in accordance with provincial and municipal planning policy. At this stage of the project, this Natural Heritage Existing Conditions and Preliminary Constraints report is prepared to document current natural heritage considerations and constraints for purposes of project planning during the evaluation of engineering alternative solutions for the ultimate selection of the preferred design.

This report is based upon background information collected from the Ministry of Environment Conservation and Parks (MECP), Ministry of Natural Resources and Forestry (MNRF), Nottawasaga Valley Conservation Authority (NVCA), the County of Simcoe, and the Town of Wasaga Beach. The report includes mapping and other supplementary background material to assist in the completion of the assessment. At this time, terrestrial and aquatic site visits were completed in fall 2019 to confirm the background information and ground truth existing conditions within the study area. Additional field study has been scheduled for 2020.

As requested by Tatham, this report reflects the existing conditions and assessed constraints relating to the study area and ROW identified in the attached Figure 1.

2.0 STUDY APPROACH

Azimuth conducted a terrestrial survey of the project area on October 29, 2019 with a focus on gathering information to explore the potential for SNHF such as Endangered (END), Threatened (THR) or Special Concern (SC) species, rare habitats, significant woodlands or wetlands, ***etc.***, to occur in or adjacent to the proposed project area. The study area focused on features within the ROW, while considering features, functions and connections on adjacent public and private lands beyond the ROW, as shown on Figures 2a, 2b and 2c.

The following activities and protocols were used to gather data for the study:

2.1 Existing Data Sources

A review of existing documents provided information on site characteristics, habitat, wildlife, vegetation communities, and general aspects of the study area. Data were gathered from the following sources:

- Aerial images (Google, Air photos);
- Atlas of the Breeding Birds of Ontario (OBBA) [https://www.birdsontario.org/atlas/datasummaries.jsp?lang=en];
- MNRF's NHIC Make-A-Map: Natural Heritage Areas application [https://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US];
- County of Simcoe Interactive Map [https://maps.simcoe.ca/public/];
- NVCA Interactive Map [https://maps.simcoe.ca/NVCA/];
- Ontario Nature – Ontario Reptile and Amphibian Atlas [https://ontarionature.org/oraa/maps/];
- MNRF's Species at Risk (SAR) Ontario list [https://www.ontario.ca/page/species-risk-ontario]; and
- Atlas of the Mammals of Ontario (Dobbyn 1994).

2.2 Vegetation Community Surveys and Mapping

A field survey was completed in October 2019 to conduct a high-level cataloguing and delineation of vegetation community types and plant species compositions. During vegetation community classification work, the assessment focused on ensuring that appropriate effort was made to detect any federally or provincially designated species – notably SAR as identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and by the Committee on the Status of Species at Risk in Ontario (COSSARO) – or their habitats. The site visit was conducted by a qualified ecologist with knowledge related to SAR as well as rare plant species with potential to occur in the area.

Vegetation community types were classified using the Ecological Land Classification for southern Ontario (Lee ***et al***., 1998, 2009 DRAFT Update), and are discussed below.

2.3 Wildlife Surveys

2.3.1 General

Incidental observations of wildlife were collected to provide additional information related to the study area. Wildlife species utilizing the study area were identified from direct observation and through interpretation of sign (***i.e.*** tracks, scats, vocalizations) as a matter of course while conducting the site assessment. This information was used, along with available background data related to wildlife use of the study area, to determine any sensitive areas associated with wildlife expected to be present. Significant wildlife habitat (SWH) was identified, where applicable, as outlined within the Significant Wildlife Habitat Technical Guideline (MNR, 2000) and the Significant Wildlife Habitat Criterion Schedule for 6E (MNRF, 2015).

2.4 Vascular Plants

A field survey for vascular plants was conducted on October 29, 2019 during a thorough site evaluation. The purpose of the vascular plants survey was to assess for presence of rare or SAR plant species in order to identify potential constraining issues in the evaluation of alternative solutions.

2.4.1 Butternut

Butternut (***Juglans cineria***) has been recorded in many areas of Wasaga Beach (MNRF; S. Martin, personal knowledge). As such, a dedicated search for Butternut was conducted throughout the study area.

2.5 Species at Risk

SAR screening was undertaken for this project which included an assessment of the habitat requirements of SAR with potential to occur in the study area. The screening was based on air photo interpretation and general knowledge of the area to identify habitats specific to the study area. Habitat requirements and SAR designations (END, THR or SC) for all species with the potential to occur in the area are outlined in Table 2.

Typically, where it is determined that potential habitat of a SAR occurs in an area of proposed activity/development, preliminary mapping is created to determine if the proposed works can be carried out with a reasonable certainty that no impacts to the species or their habitat will be incurred as a result of the works. Where there is uncertainty of the ability to avoid habitat, or where it is unclear exactly what future works will be undertaken, additional surveys are carried out to determine if the potential habitat is being used by the species in question. No specific work activities or locations have been proposed. As such, no targeted bird, mammal or vegetation surveys have been completed at this stage of the project.

2.6 Aquatic Habitat and Fisheries

Numerous documents, such as the NVCA's Fisheries Management Plan, are readily available that document fish and fish habitat conditions in the Nottawasaga River. Background reference documents were used for the study combined with historical knowledge of the fish and fish habitat conditions to understand the form and function of the aquatic habitat in the study area.

3.0 EXISTING SITE CONDITIONS

3.1 General Site Description

The study area is situated in the downtown core of the Town of Wasaga Beach, an area that has been heavily urbanized and repeatedly subjected to development and anthropogenic disturbance. Very little natural tree cover or other habitat remains along the majority of Main Street, which is comprised of stores, accommodations, tourism and other businesses, a small number of residential lots, and associated infrastructure such as driveways, parking lots, advertising signs and landscaped areas. Along Main Street, there are many native (Maple, Oak, Serviceberry, Cedar, Spruce) and non-native (Honey Locust, Burning Bush, Euonymus, Linden) trees and shrubs, planted and maintained as part of the landscaping at retail complexes and residences/cottages, as well as for municipal streetscaping.

The majority of the historic woodland areas along the side streets have been cleared for private home and cottage development, along with several commercial cottage courts. However, there are some small swaths of woodland bordering connected streets (e.g. Wood Avenue, 6th Street N), (Figure 2c). While many of the larger Red Oak and White Pine canopy trees have been preserved in these areas, the canopy is considerably more open than is natural, and there is generally little to no natural woodland structure below the canopy, typically because this space is occupied by homes or cottages.

Along Mosley Street and Beach Drive, between Spruce Street and 3rd Street (Figures 2a, 2b), there is little to no natural vegetation. The area is completely developed, consisting primarily of paved parking lots, along with beach-front shops, restaurants, and tourism businesses. On either side of Mosley Street between 3rd Street and 6th Street (Figure 2a), there are two large municipal parking lots and several residential lots. Therefore, there is minimal natural vegetation in these areas. Beach Area 2 is situated to the north-west of Mosley Street. This area is comprised of treed foredunes (the initial dunes inland from the beach), which have been heavily impacted by significant human use for picnicking, parking, beach access and other purposes and park amenities over many years.

The study area contains the main branch of the Nottawasaga River, flowing under the Main Street Bridge in a north-easterly direction before discharging into Nottawasaga Bay, the southern extent of the greater Georgian Bay. The Nottawasaga River provides important recreational opportunities for the community of Wasaga Beach including angling, hosting a diverse fish community that includes migratory Chinook Salmon, Rainbow Trout, game fish and aquatic SAR as described below.

The natural soils within the study area are generally well-drained, nutrient-poor, very fine sand, typical of much of Wasaga Beach.

3.2 Vegetation Communities

Virtually all the lands within the study area have been impacted and influenced by human development and other activities. The study area includes six (6) vegetation community types, and eleven (11) natural areas. Most of these are small in size and do not officially qualify for vegetation community status under ELC protocols ***(i.e.*** – under 0.5 ha).

The largest natural communities within the study area are associated with the beach and dunes of Beach Areas 1 and 2. The open sandy beach of the Mineral Open Shoreline Ecosite (SHOM1) extends from Beach Areas 1 and 2, westward along the Nottawasaga Bay shore to the western limits of Wasaga Beach (Figures 2a, 2b). The Balsam Poplar Treed Sand Dune (SBTD1-2) occupies the beach-front foredunes adjacent to the open shoreline within Beach Area 2 (Figure 2a). This provincially rare (S1) community is dominated by Balsam Poplar and American Beech Grass. While a naturally occurring community, it has been heavily disturbed by vehicle parking, picnicking space, a comfort station and uncontrolled and highly braided walking paths.

The two Mixed Meadow (MEMM3) ecosites along the east side of Main Street are comprised of predominantly "weedy" species such as Wild Carrot, Smooth Brome and Quack Grass, along with various Goldenrods and Asters. Both of these communities are partially maintained for use as seasonal parking areas (Figures 2b, 2c).

There are two small units of Sugar Maple – White Birch – Poplar Deciduous Forest (FODM5-10) within the ROW adjacent to Wood Ave., with a 3rd just outside of the ROW (Figure 2c). They are mid-aged with semi-closed canopies and dense shrub and ground flora layers indicative of 2nd growth arising after disturbance. These communities are segmented and isolated by the side streets, and/or partially cleared for residential development. Most of the mapping resources indicate that the Fresh-Moist White Spruce – Hardwood Mixed Forest (FOMM10-2) community to the east of Wood Ave. (Figure 2c) extends southward to Main Street. However, the most updated Simcoe County mapping and field study confirmed that the southern part of this woodland has been

removed to accommodate a portion of the retail development (KFC and Taco Bell franchises and adjacent lands).

Two small Dry-Fresh White Pine – Oak Mixed Forest communities occur along River Road East, immediately east of Main Street (Figure 2b). These woodlots are dominated by mature Eastern White Pine and Red Oak, and contain healthy understory, shrub and herb layers, growing on fine, well-drained sandy-silty soils. Three more of these communities can be found along the south side of Mosley Street, adjacent to the Nottawasaga River, between 4th Street and 6th Street (Figure 2a). The westernmost two of these lots are occupied by homes/cottages, so contain little natural woodland structure below the canopy. The eastern lot is the most natural, as it does not house any structures, but Aerial photography shows that approximately ½ of the central portion of this woodland is void of canopy and understory.

The Provincial and County mapping resources indicate woodland to the north of Mosley Street, adjacent on either side of 6th Street (Figure 2a). However, the majority of the treed areas lie outside of the ROW, and in-field investigations revealed that the mature trees within this area are canopy-only, with no associated understory, shrub or ground layer. As such, these small areas do not comprise a natural woodland vegetation community.

One of the vegetation communities identified within the study area (SBTD1-2) (Figure 2a) is considered to be provincially rare (S1) and of provincial significance, and thus warrants protection. However, very little natural form or function remains in the portion within the ROW. It is removed from the remainder of this community type by a separation of over 40m of open sand, referred to as a blowout (characterized as heavy erosion of sand caused by wind – generally the result of significant soil and vegetation disturbance). As such, loss of this small portion of the community should not affect the natural functions of the greater SBTD1-2 vegetation community, should the re-development plan require the use of this land. The size, function and composition of the remainder of the vegetation communities present on this site are a direct result of human disturbance, and many are dominated by non-native and invasive plant species.

3.2.1 Wetland Habitat

An unnamed wetland designated as provincially significant (PSW) (Figure 2c) is present northeast of Wood Avenue, however, it is situated approximately 50-60 metres beyond the road ROW. Given distance from the roadway it is considered herein (and future EIS) but likely does not represent a constraint to development in the consideration of design alternatives.

3.3 Vascular Plants

A total of 111 vascular plant species were recorded in the study area on October 29, 2019. Sixty-four of these species (58%) are native to Ontario, while 46 species (42%) are non-native and/or horticultural cultivars. Several are considered highly invasive, with many listed as noxious weeds. None of the vascular plant species recorded is considered to be rare or of local, regional or provincial significance.

No vascular plant SAR was recorded during the survey. A formal table of vascular plants recorded on the site will be included in the EIS, during the evaluation of engineering design alternatives.

3.3.1 Butternut

Butternut can be found in several locations around Wasaga Beach (MNRF; S.Martin, personal knowledge). They may grow in a wide variety of sites and conditions, but prefer rich, moist, well-drained loams and well-drained rocky soils. No Butternut trees were found during the targeted survey. It is expected that the very dry, sandy soils throughout this portion of Wasaga Beach, combined with historical habitat disturbances, create conditions that are not favourable to the growth and development of Butternut trees.

3.4 Wildlife

3.4.1 General

Wildlife species utilizing the study area were identified from direct observation and through interpretation of sign (***i.e***. tracks, scats, vocalizations) as a matter of course while conducting the survey. No unusual or unexpected wildlife were observed as incidental encounters. Based on field observations, the presence of the Nottawasaga River, the extensive urban landscape, and proximity to Wasaga Beach Provincial Park, the following mammal species are presumed to be present within the study area:

- Coyote (***Canis latrans***), Eastern Grey Squirrel (***Sciurus carolinensis***), Raccoon (***Procyon lotor***), Red Squirrel (***Tamiasciurus hudsonicus***), Beaver (***Castor canadensis***), Red Fox (***Vulpes vulpes***), Striped Skunk (***Mephitis mephitis***), Virginia Opossum (***Didelphis virginiana***) and White-tailed Deer (***Odocoileus virginianus***).

None of the species are considered rare or designated SAR.

3.5 Species at Risk

Based on a review of background data, SAR with the potential to occur in the area that are considered in our assessment are shown on Table 1. Of the species identified with potential to exist within the study area, the following were identified, based on habitat requirements or known presence:

- Birds: Barn Swallow (***Hirundo rustica***), Piping Plover (***Charadrius melodus***)***;***
- Mammals: Little Brown Myotis (***Myotis lucifugus***), Northern Long-eared Myotis (***Myotis septentrionalis***), and Tri-colored Bat (***Perimyotis subflavus***);
- Reptiles: Northern Map Turtle (***Graptemys geographica***), Snapping Turtle (***Chelydra serpentine***), Eastern Hog-nosed Snake (***Heterodon platirhinos***); and
- Fish: Lake Sturgeon (***Acipenser fulvescens***).

None of the SAR listed above were recorded during the October 29, 2019 field visit.

Potential habitat for species listed as THR or END under the ***Endangered Species Act,*** 2007 (ESA) was identified in proximity to the study area. Habitat requirements associated with these species, as outlined in Table 1, will require consideration during the evaluation of roadway alternative solutions and future work in the area. Based on habitat requirements, potential exists for any of the SAR listed above to be present.

NHIC SAR information queries indicated that a "Restricted Species" has been recorded in the vicinity of the study area. An information request regarding this restricted species has been sent to the MECP, however a response has not been received to date. As such, Azimuth is uncertain as to which species this is, as well as the potential for this species to occur within the study area. During the initial site survey in October, 2019, Azimuth staff did not record significant habitat for any restricted species known to be found within Simcoe County.

3.6 Aquatic Habitat and Fisheries

The study area contains the main branch of the Nottawasaga River which flows under the Main Street Bridge in a north-easterly direction before discharging into Nottawasaga Bay, part of the greater Georgian Bay. This bridge connects Main Street to Mosley Street and is located approximately 2 km south-west of the mouth of the Nottawasaga River (Figures 2a, 2b).

The headwaters of the Nottawasaga River contain coldwater systems, while the middle and lower reaches contain warmwater systems historically subject to impacts from urbanization and agriculture. The lower stretch of the Nottawasaga River supports some

of the largest spawning populations of Lake Sturgeon (***Acipenser fulvescens***) and Walleye (***Sander vitreus***) in Southern Ontario and North America, respectively. Additionally, the lower reaches of the Nottawasaga provide habitat and spawning grounds for other warmwater species, such as Smallmouth Bass, Largemouth Bass, Northern Pike, and possibly Muskellunge (NVCA Fisheries Management Plan, 2009).

As previously mentioned, the lower reaches of the Nottawasaga are known to contain Lake Sturgeon, a provincially and federally listed SAR protected provincially under the ESA as END.

4.0 PROPOSED DEVELOPMENT

The Town of Wasaga Beach is proposing improvements that include the reconstruction of Main Street and alternatives for the downtown revitalization in accordance with a Class EA. The goal of the EA is to implement and determine a common shared vision and design of the downtown streetscape and to create an aesthetically pleasing environment to attract business, investors and the public (Town RFP, #PW2018-11, 2018). Improvements include evaluating and improving storm sanitary and watermain infrastructure, road widening, intersection improvements, roundabouts, and pedestrian and cycling facilities, to Main Street from River Road West to Mosley Street; Mosley Street from Main Street to 6th Street; and, Beach Road corridors. The study area (Figure 1) includes the roads and ROW within this area, as well as adjacent public and private land beyond the ROW, where accessible and reasonable.
The project includes the completion of Phases 1-3 of the Class EA, including the identification of suitable design alternatives, and selection of the preferred design at the outcome of the project. The project includes preliminary consultation with regulatory stakeholders, with Azimuth's involvement to determine environmental constraints and permitting requirements for consideration in the EA.

5.0 POTENTIAL CONSTRAINTS

5.1 Birds

5.1.1 Barn Swallow

There is potential that Barn Swallows may be found nesting within the study area, particularly in areas such as under the Main Street Bridge, under the eaves on some old buildings and possibly even on large advertising billboards. Before any work is undertaken, the area should be surveyed by a qualified ecologist to identify active Barn Swallow nests. Where they are found, it is expected that disturbance to Barn Swallows and other nesting birds can be easily mitigated by restricting the timing of construction

works that could disturb the nests to outside of the active nesting window. Activity that has the potential to impact Barn Swallow during the nesting season is prohibited between April 1 and August 31.

5.1.2 Piping Plover

It is widely known by local residents of Wasaga Beach that Piping Plovers have been nesting on the open beach of Beach Area 1, north of Beach Drive, for many years. This END species relies on large, open sandy beaches with small amounts of vegetation and vegetative debris for nesting, shelter and foraging. The section of the beach on which they have been nesting is located more than 50 metres outside of the study area. Development within the ROW is not expected to have any effect on the nesting area of Piping Plovers, provided that equipment and personnel are also kept outside of the 50m buffer.

5.2 Mammals

5.2.1 Bats

Little Brown Myotis, Northern Long-eared Myotis and Tri-colored Bats may roost in large snag trees, old buildings and other locations in the study area. Significant natural habitat for maternal roost colonies is generally comprised of clusters of snag trees in woodland habitat. The field survey indicated that there are a few low quality locations (single snag trees, some old building) where potential habitat for roosting bats exists within the ROW. As such, while significant habitat locations do not appear to exist, there remains potential for all three species to be actively roosting and foraging within the study area. Bat acoustic surveys may help to determine if and where such bat species are concentrated, and help provide input to their activities. Timing restrictions for disturbance of confirmed or potential bat habitat, such as snag trees or old buildings, will help mitigate potential disturbance to SAR bats. Development in known significant habitat for SAR bats should be conducted outside of the bat active window, which is considered April 1 through to October 31.

5.3 Reptiles

5.3.1 Northern Map Turtle and Snapping Turtle

Both turtle species have potential to be found in the lower reaches of the Nottawasaga River that include the study area at the Main Street Bridge. Any proposed works within the current ROW has the potential to impact turtles however impacts are expected to be mitigable through appropriate timing restrictions and sediment and erosion control methods.

5.3.2 Eastern Hog-nosed Snake

Eastern Hog-nosed Snakes have been recorded throughout many areas of Wasaga Beach (Featherstone and Anderson 2005). They prefer sandy woodlands, fields and wetlands where they forage for their preferred prey, American Toads. The small PSW to the east of Wood Ave. lies over 60m from the ROW along Wood Ave (Figure 2c). The forested habitat between the PSW and Wood Ave. does not provide the open forest cover that this species prefers, so they are unlikely to be using this woodland as a travel corridor. This area, along with the remainder of the study area, is highly disturbed and developed with no contiguous linkages to designated significant habitat for this species, which would significantly limit the potential for safe, sheltered Hog-nosed snake travel and foraging.

No portion of the study area has been deemed significant habitat for Eastern Hog-nosed Snakes in the Town of Wasaga Beach Natural Heritage System: Eastern Hog-nosed Snake Discussion Paper (Featherstone, 2005). As any development within the study area should have due regard for all snake species encountered, affects to Eastern Hog-nosed Snakes that might be occupying the study area are expected to be mitigable.

5.4 Fish

5.4.1 Lake Sturgeon

The Nottawasaga River provides diverse habitat conditions for fish, and is protected under the federal ***Fisheries Act.*** As such, timing restrictions will apply for any work occurring in and/or around the river to reduce the risk of harm to those fish and their habitats. The evaluation of design alternatives will confirm the potential for impacts to the river however impacts are expected to be minimal assuming limited or no footprint changes, and mitigable through appropriate sediment and erosion control methods.

6.0 CONCLUSIONS

The scope of roadway improvements is currently being evaluated as part of Phase 2 of the EA, and is anticipated to include development options within the ROW, as shown on Figures 2a-c. This report summarizes results of field and desktop studies to determine environmental impacts that may result from the project within this area.

For the purposes of this study, and based on the preliminary information presented herein, our findings conclude that improvements such as road widening, intersection improvements, roundabouts and pedestrian and cycling facilities within the study area are feasible from an environmental perspective. Environmental impacts to SAR, SWH or other significant natural heritage features are expected to be readily mitigated through proper project planning and rehabilitation initiatives.

Further environmental review will occur in consultation with the Town of Wasaga Beach during the evaluation of suitable design alternatives for the Class EA. Impacts and mitigating measures will, at that time, be documented in an EIS report.

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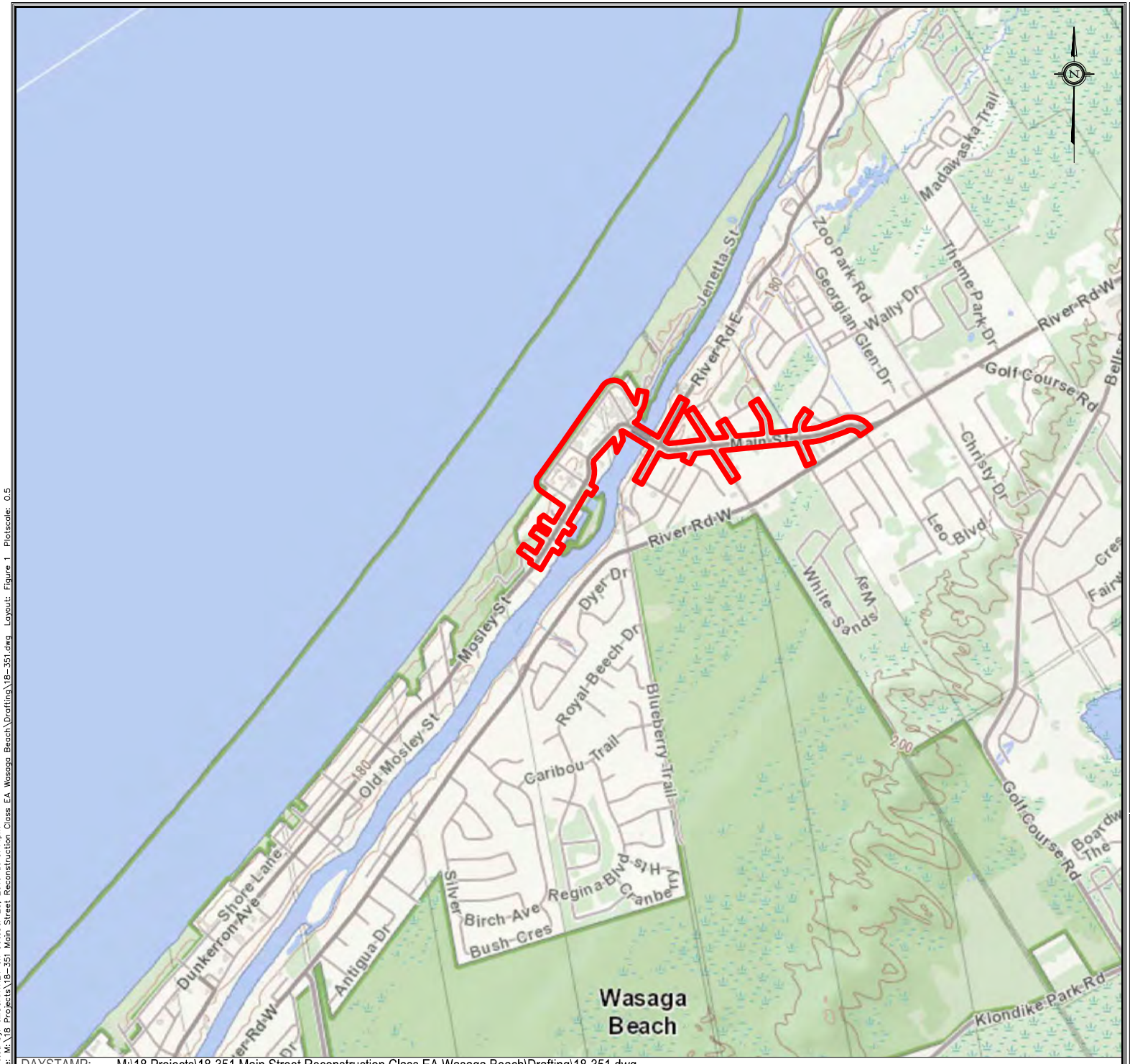

LEGEND:

Approx. Property Boundary

REG MAP

250m 0 750m

HORIZONTAL SCALE 1: 25,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Study Area Location

Main Street Reconstruction,
Wasaga Beach, ON

DATE ISSUED: *October 2019*	Figure No.
CREATED BY: *JLM*	
PROJECT NO.: *18-351*	1
REFERENCE: *MNRF*	

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on October 25, 2019 at 3:44pm
File: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg Layout: Figure 1 Plotscale: 0.5

Draft

SHOM1
SBTD1-2
CGL_2
Commercial
Residential
Church
FOMM2-1
Mosley St
3rd St.
2nd St.
1st St.
Beach Dr.
Nottawasaga River
River Ave.
Main St.
Residential

LEGEND:

- Approx. Property Boundary
- Watercourse
- Flow Direction
- Provincially Significant Wetland
- Unevaluated Wetland
- Woodland Area
- Vegetation Communities

CGL_2	Parkland
FODM5-10	Dry-Fresh Sugar Maple-White Birch-Poplar Deciduous Forest Type
FOMM2-1	Dry-Fresh White Pine-Oak Mixed Forest Type
FOMM10-2	Fresh-Moist White Spruce-Hardwood Mixed Forest Type
MEMM3	Dry-Fresh Mixed Meadow Ecosite
SBTD1-2	Balsam Poplar Treed Sand Dune Type
SHOM1	Mineral Open Shore Ecosite

25m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction,
Wasaga Beach, ON

DATE ISSUED:	October 2019	Figure No.
CREATED BY:	JLM	2a
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on December 16, 2019 at 3:22pm
File: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\04.0 - Drafting\18-351.dwg Layout: EIS2a Plotscale: 0.5

LEGEND:

- Approx. Property Boundary
- Watercourse
- Flow Direction
- Provincially Significant Wetland
- Unevaluated Wetland
- Woodland Area
- Vegetation Communities

CGL_2	Parkland
FODM5-10	Dry-Fresh Sugar Maple-White Birch-Poplar Deciduous Forest Type
FOMM2-1	Dry-Fresh White Pine-Oak Mixed Forest Type
FOMM10-2	Fresh-Moist White Spruce-Hardwood Mixed Forest Type
MEMM3	Dry-Fresh Mixed Meadow Ecosite
SBOD1-26	Rush-Canada Wild Rye-Smooth Aster-Wormwood Open Embryonic Sand
SBTD1-2	Balsam Poplar Treed Sand Dune Type
SHOM1	Mineral Open Shore Ecosite

25m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction,
Wasaga Beach, ON

DATE ISSUED:	October 2019	Figure No. 2b
CREATED BY:	JLM	
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on December 13, 2019 at 9:19am
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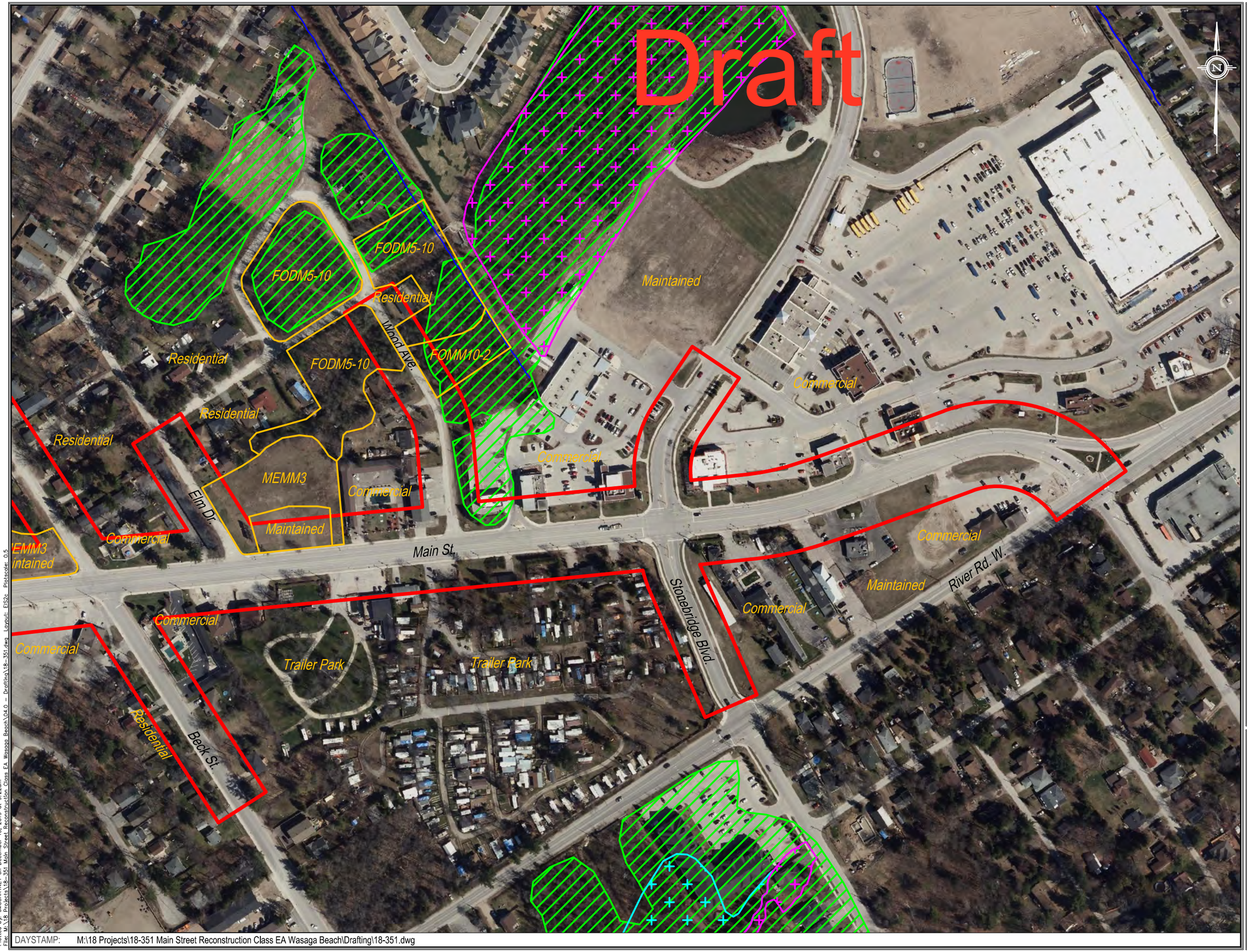


LEGEND:

- Approx. Property Boundary
- Watercourse
- Flow Direction
- Provincially Significant Wetland
- Unevaluated Wetland
- Woodland Area
- Vegetation Communities

CGL_2	Parkland
FODM5-10	Dry-Fresh Sugar Maple-White Birch-Poplar Deciduous Forest Type
FOMM2-1	Dry-Fresh White Pine-Oak Mixed Forest Type
FOMM10-2	Fresh-Moist White Spruce-Hardwood Mixed Forest Type
MEMM3	Dry-Fresh Mixed Meadow Ecosite
SBOD1-26	Rush-Canada Wild Rye-Smooth Aster-Wormwood Open Embryonic Sand
SBTD1-2	Balsam Poplar Treed Sand Dune Type
SHOM1	Mineral Open Shore Ecosite

25m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction, Wasaga Beach, ON

DATE ISSUED:	October 2019	Figure No.
CREATED BY:	JLM	2c
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on December 13, 2019 at 9:22am
File: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\04.0 - Drafting\18-351.dwg Layout: EIS2c Plotscale: 0.5

18-351 Table 1.0: SAR Assessment for Main Street Revitalization

TAXA	SPECIES	STATUS (as of Dec 2019)	DESCRIPTION OF HABITAT USED	Habitat Within or Adjacent to Site of Proposed Development?	Reported Locally?[3]	Detected During Field Surveys?[4]	Issue Affecting Proposed Development?
Birds	Barn Swallow	THR	nest on ledges or walls in and outside of barns and other man made structures including buildings and bridges, may also use natural cliffs and caves.	Yes	Yes	No	Yes
Birds	Bank Swallow	THR	nest colonially in burrows, natural and human-made settings where there are vertical faces in silt and sand deposits, may nest on banks of rivers and lakes but can also be found in active or former sand and gravel pits	No	Yes	No	No
Bird	Black Tern	SC	large cattail marshes in wetlands	No	Yes	No	No
Bird	Bobolink	THR	hayfields and grassland habitats, pastures and some crop lands	No	Yes	No	No
Bird	Canada Warbler	SC	deciduous and coniferous forests, usually wet forest types with a well developed, dense shrub layer	No	Yes	No	No
Bird	Chimney Swift	THR	in and around urban settlements where they nest and roost in chimneys and other vertical manmade structures, will also use hollow trees or tree cavities in older growth forests, often near water	No	Yes	No	No
Bird	Common Nighthawk	SC	open areas with little to no ground vegetation, such as forest clearings, rock barrens, peat bogs, lakeshores and logged or burned over areas	No	Yes	No	No
Birds	Eastern Meadowlark	THR	native grasslands, pastures, agricultural fields especially in alfalfa and hay, old fields, meadows	No	Yes	No	No
Birds	Eastern Wood-Pewee	SC	intermediate-age mature forest stands with little understory vegetation, edges of deciduous and mixed forests	No	Yes	No	No
Bird	Golden-winged Warbler	SC	areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas	No	Yes	No	No

Bird	Grasshopper Sparrow	SC	prefers drier, sparsely vegetated grasslands, particularly rough or unimproved pastures at least 30 hectares in size supporting varying amounts of forbs and shrubs	No	Yes	No	No
Bird	Least Bittern	THR	large, quiet marshes with cattails	No	Yes	No	No
Bird	Olive-sided Flycatcher	SC	coniferous or mixed forest adjacent to wetlands or rivers	No	Yes	No	No
Bird	Piping Plover	END	wide open beaches along Lake Huron and Southern Georgian Bay shoreline	Yes	Yes	No	Yes
Bird	Red-headed Woodpecker	SC	nests in cavities in dead or mature trees, open woodland and woodland edges, especially in oak savannahs and riparian forest and habitats which contain a high density of dead trees,	No	Yes	No	No
Bird	Short-eared Owl	SC	open areas such as grasslands, marshes, wet meadows, fields and forest clearings	No	Yes	No	No
Bird	Whip-poor-will	THR	open woodlands or openings in mixed forests, rock or sand barrens with scattered trees, savannahs	No	Yes	No	No
Bird	Wood Thrush	SC	mature deciduous and mixed forests, moist stands of trees with developed undergrowth, prefer large forests, nests in live saplings, trees or shrubs	No	Yes	No	No
Fish	Lake Sturgeon	END	inhabits the bottoms of shallow areas of large freshwater lakes and rivers, spawns in the Nottawasaga River	Yes	Yes	No	Potentially, if in-water works required
Insect	Monarch Butterfly	SC	wherever there are milkweed plants and wildflowers, often found in old fields, abandoned farmland and roadsides	Yes	Yes	No	No
Mammals	American Badger	END	found in remnant tallgrass prairie, sand barrens and farmland, wooded areas adjacent to farmland and ravines	No	Yes	No	No
Mammal	Eastern Small-footed Bat	END	roost under rocks, rock outcrops, in buildings, under bridges or in caves, mines or hollow trees	No	No	No	No
Mammal	Little Brown Bat	END	roost in trees or buildings during the day, often select attics, abandoned buildings and barns for summer colonies. Hibernate in caves and abandoned mines	Yes	Yes	No	Yes
Mammal	Northern Long-eared Bat	END	roost under loose bark and in the cavities of trees, hibernate in caves or abandoned mines	Yes	Yes	No	Yes

Mammal	Tri-coloured Bat	END	found in a variety of forested habitats, maternity colonies may be found in trees, rock crevices, and barns or other buildings. Hibernate in caves, mines and tunnels.	Yes	Yes	No	Yes
Plant	Butternut	END	found in variety of sites, commonly in forest openings, old fields, hedgerows, on floodplains, stream sides or gradual slopes.	Yes	Yes	No	No
Plant	Hill's Thistle	THR	open sunny sites, including prairies and woodland alvars.	No	Yes	No	No
Plant	Spotted Wintergreen	THR	dry, oak-pine woodland habitats with sandy soils	Yes	Yes	No	No
Reptile	Eastern Hog-nosed Snake	THR	sandy, well-drained habitats including dry woods, open sandy areas, fields and shrublands and wetlands	Yes	Yes	No	Yes
Reptile	Eastern Musk Turtle	SC	shallow, slow-moving water around Georgian Bay	No	Yes	No	No
Reptile	Northern Map Turtle	SC	large rivers and lakes	Yes	Yes	No	Potentially, if in-water works required
Reptile	Snapping Turtle	SC	very aquatic species, spend most of their lives in water, prefers shallow water in wetland habitats.	Yes	Yes	No	

[1]Comprehensive list compiled based on Species at Risk in Town of Wasaga Beach - MECP, July 10th, 2019

[2]Based on the SARO List descriptions (https://www.ontario.ca/page/species-risk-ontario)

[3]Based on following sources: Species at Risk Ontario (https://www.ontario.ca/environment-and-energy/species-risk-ontario-list); Land Information Ontario (https://www.ontario.ca/page/land-information-ontario); Make a Natural Heritage Map - Natural Heritage Information Centre (http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US); Ontario Breeding Bird Atlas (http://www.birdsontario.org/atlas/maps.jsp?lang=en); Ontario Reptile and Amphibian Atlas (https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/), eBird (https://ebird.org/explore); Fisheries and Oceans Canada (http://www.dfo-mpo.gc.ca/species-especes/index-eng.htm); Fish Online (https://www.gisapplication.lrc.gov.on.ca/FishONLine/Index.html?site=FishONLine&viewer=FishONLine&locale=en-US); Ontario Butterfly Atlas (http://www.ontarioinsects.org/atlas_online.htm); and Atlas of the Mammals of Ontario (Dobbyn, J. 1994. Federation of Ontario Naturalists).

[4]Based on field survey on October 29, 2019

APPENDICES

Appendix A: **NHIC, Simcoe County Map and NVCA Regulated Lands Mapping**
Appendix B: **MECP Info Request and NHIC SAR Data Query**
Appendix C: **NVCA Terms of Reference**

APPENDIX A

NHIC,
Simcoe County Map
NVCA Regulated Lands Mapping

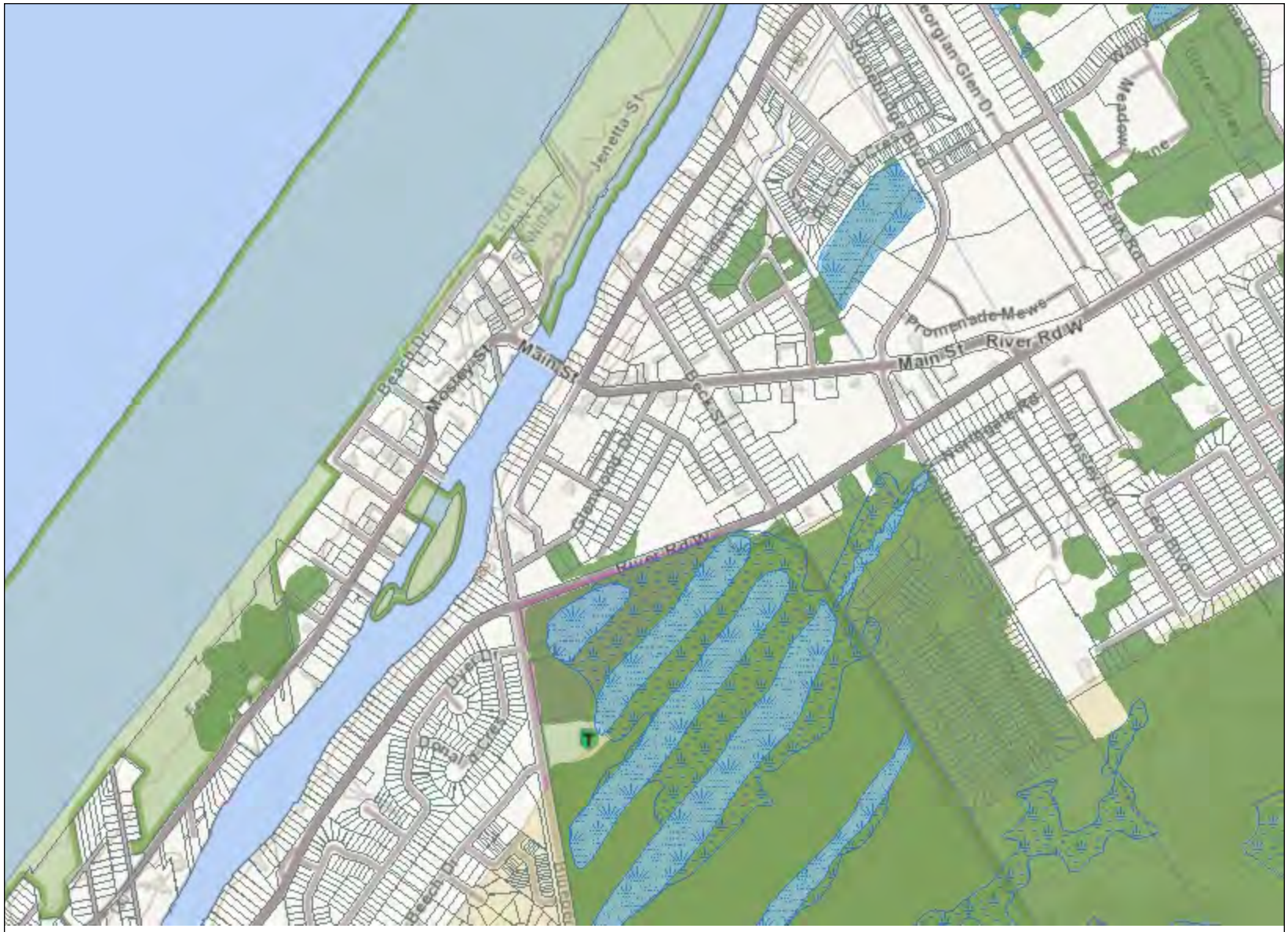
Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

MNRF- NHIC Mapping

Notes: Enter map notes



Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion

Wetland
- Provincially Significant Wetland Evaluated
- Non - Provincially Significant Wetland Evaluated
- Unevaluated Wetland

Area of Natural Heritage & Scientific Interest (ANSI)
- Provincially Significant Life Science ANSI
- Provincially Significant Earth Science ANSI

Greenbelt Plan
- Boundary
- River Valley Connections

Land Use Designations
- Protected Countryside
- Towns and Villages
- Hamlets
- Urban River Valley
- Specialty Crop Area

Niagara Escarpment Plan (NEP)
- Boundary
- Parks and Open Space System

Land Use Designations
- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area
- Urban Area
- Minor Urban Centre

Oak Ridges Moraine Conservation Plan (ORM)
- Boundary

Land Use Designations
- Natural Core Area
- Natural Linkage Area
- Countryside Area
- Rural Settlement
- Palgrave Estates Residential Community
- Settlement Area

0.7 0 0.33 0.7 Kilometers

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry(OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

NVCA - Regulated Lands Map

0 0.125 0.25 0.5 km

1:9,028

October 25, 2019

Wasaga Beach Main Street Reconstruction Area

0 0.225 0.45 0.9 km

1:10,000

December 18, 2019

APPENDIX B

MECP Info Request
NHIC SAR Data Query

Information Request

Date: October 21st, 2019 **Project Reference:** AEC 18-351

Azimuth Contact: Jason Runtas, Ecologist
jruntas@azimuthenvironmental.com
(705) 721-8451 ext. 228

Attachments:
Figure 1 – Property Location
Figure 2 – Environmental Features
Figure 3 – Study Area

Project Location: Main Street in the Town of Wasaga Beach, from River Road West to Mosley Street, as well as Mosley Street from Main Street to 6th Street and Beach Drive (See Figure 2). UTM coordinates: 17 T 578094 E, 4930469 N

Activity Description: The proponent wishes to make improvements to the roads identified above in their current ROWs.

The following sources were queries for natural heritage information related to the general location of the property:

- Species at Risk Ontario (*i.e.* Ontario Regulation 230/08);
- Land Information Ontario;
- Natural Heritage Information Centre (Squares 17NK7729, 17NK7730, 17NK7830, 17NK7829, 17NK7930, 17NK7929);
- Ontario Breeding Bird Atlas (Square 17NK72, 17NK73);
- Ontario Reptile and Amphibian Atlas (Square 17NK72, 17NK73);
- Fisheries and Oceans Canada Aquatic SAR Map; and,
- Fish ON-Line.

Natural Heritage Features on and Adjacent to the Property:

- Unevaluated wetland adjacent to Stonebridge Boulevard (Figure 2);
- Woodlands adjacent to Wood Avenue; additional forested areas throughout adjacent lands (Figure 2); and,
- Nottawasaga River (Figure 2)

Consolidated SAR List for the Property and Adjacent Lands:

- Birds: Barn Swallow (THR), Bank Swallow (THR), Black Tern (SC), Bobolink (THR), Canada Warbler (SC) Chimney Swift (THR), Common Nighthawk (SC), Eastern Meadowlark (THR), Eastern Wood-Pewee (SC), Golden-winged Warbler (SC), Grasshopper Sparrow (SC), Least Bittern (THR), Olive-sided Flycatcher (SC), Piping Plover (END), Red-headed Woodpecker (SC), Short-eared Owl (SC), Whip-poor-will (THR), Wood Thrush (SC);
- Insects: Monarch Butterfly (SC);
- Mammals: Little Brown Myotis (END), Northern Myotis (END), Eastern Small-footed Bat (END) and Tri-colored Bat (END); American Badger (END)
- Plants: Butternut (END); Hill's Thistle (THR); Spotted Wintergreen (END)
- Fish: Lake Sturgeon (END), Silver Lamprey (SC)
- Reptiles: Northern Map Turtle (SC), Eastern Musk Turtle (SC), Snapping Turtle (SC), Blanding's Turtle (THR) and Eastern Hog-nosed Snake (THR); and,
- **RESTRICTED SPECIES.**

Information Request

The consolidated SAR list identifies the species we intend to include in our SAR assessment. Please advise if the MECP has records suggesting additional species that should be considered. Please identity the RESTRICTED SPECIES. Azimuth will protect the identity of the species in reporting that would become part of the public record.

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

LEGEND:

Approx. Property Boundary

REG MAP

250m 0 750m

HORIZONTAL SCALE 1: 25,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Study Area Location

Main Street Reconstruction,
Wasaga Beach, ON

DATE ISSUED: *October 2019*	Figure No.
CREATED BY: *JLM*	
PROJECT NO.: *18-351*	1
REFERENCE: *MNRF*	

LEGEND:

- Approx. Property Boundary
- Watercourse
- Flow Direction
- Provincially Significant Wetland
- Unevaluated Wetland
- Woodland Area

25m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction, Wasaga Beach, ON

DATE ISSUED:	October 2019	Figure No.
CREATED BY:	JLM	2a
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on October 18, 2019 at 9:24am
File: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg Layout: EIS2a Plotscale: 0.5

LEGEND:

- *Approx. Property Boundary*
- *Watercourse*
- *Flow Direction*
- *Provincially Significant Wetland*
- *Unevaluated Wetland*
- *Woodland Area*

25m 0 75m

HORIZONTAL SCALE 1:2,500

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction, Wasaga Beach, ON

DATE ISSUED:	*October 2019*	Figure No. 2b
CREATED BY:	*JLM*	
PROJECT NO.:	*18-351*	
REFERENCE:	*Simcoe County Maps*	

Plotted by: JMCCARTNEY on October 18, 2019 at 9:24am
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DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on October 18, 2019 at 9:38am
File: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg Layout: EIS2c Plotscale: 0.5

LEGEND:

- *Approx. Property Boundary*
- *Watercourse*
- *Flow Direction*
- *Provincially Significant Wetland*
- *Unevaluated Wetland*
- *Woodland Area*

25m 0 75m

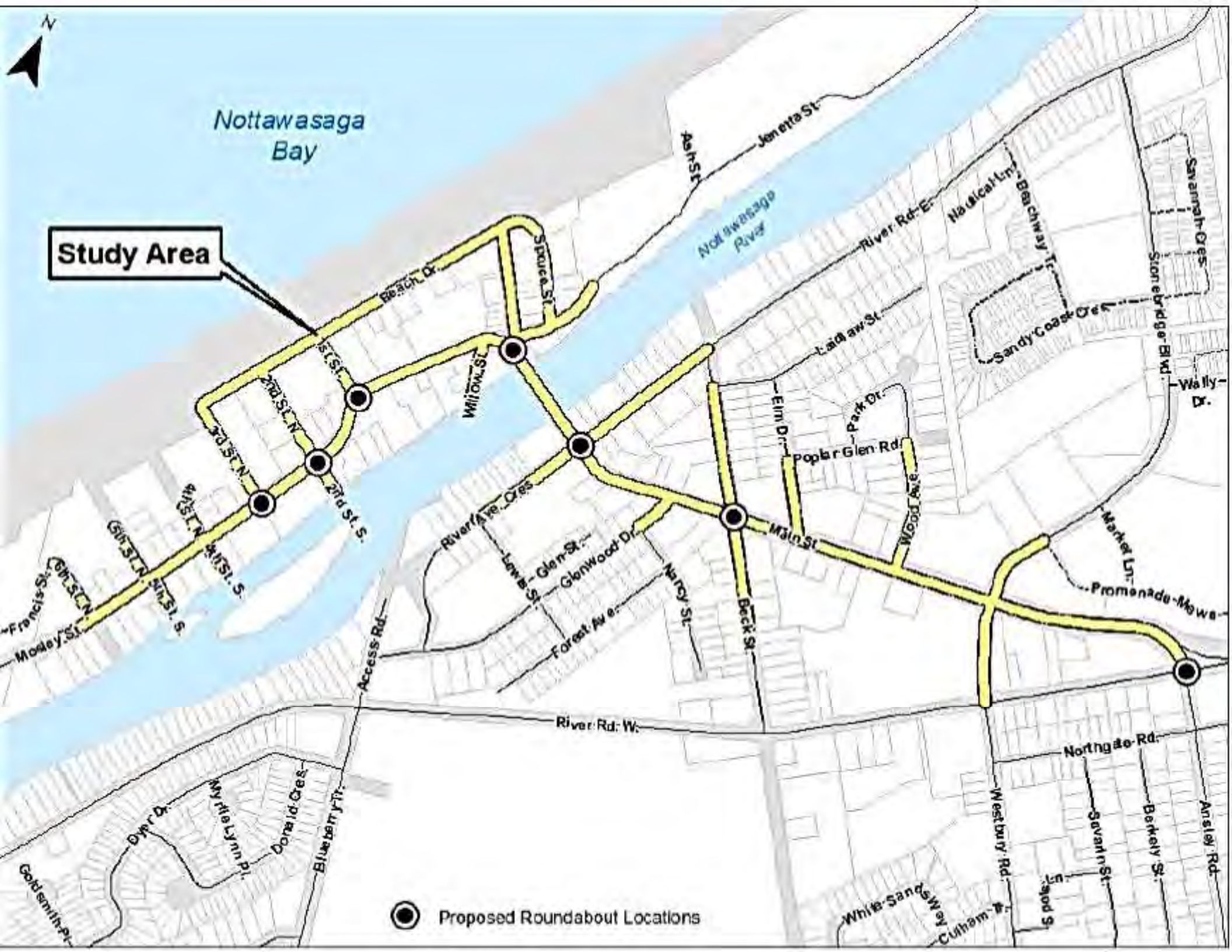
HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction, Wasaga Beach, ON

DATE ISSUED:	*October 2019*	Figure No. 2c
CREATED BY:	*JLM*	
PROJECT NO.:	*18-351*	
REFERENCE:	*Simcoe County Maps*	


N
Nottawasaga Bay
Study Area
Nottawasaga River
Ash St
Jeneta St
River Rd E
Nautical Ln
Beachway Tr
Savannah Cres
Stonebridge Blvd
Sandy Coast Cres
Wally Dr
Laidlaw St
Elm Dr
Park Dr
Poplar Glen Rd
Wood Ave
Main St
Market Ln
Promenade Mews
Beach Dr
Spruce St
1st St S
2nd St S
3rd St S
4th St S
5th St S
6th St S
7th St S
Willow St
Francis St
Morley St
River Ave Cres
Lewis St
Glen St
Glenwood Dr
Forest Ave
Nancy St
Beck St
Access Rd
River Rd W
Northgate Rd
Westbury Rd
Savarin St
Berkely St
Ansley Rd
Dyer Dr
Myrtle Lynn Pl
Donald Cres
Blueberry Tr
Goldsmith Pl
White Sands Way
Cuthem Pl
Proposed Roundabout Locations

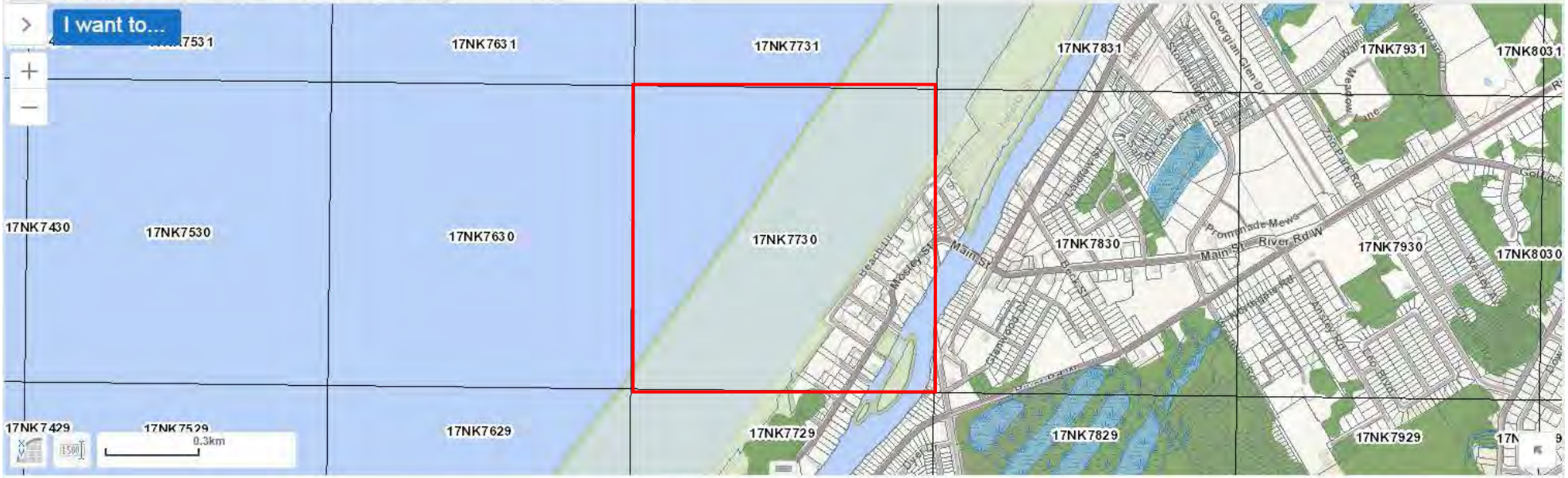
[Français]

Ontario **Ministry of Natural Resources and Forestry**
Make A Map: Natural Heritage Areas

Looking for a Park, Reserve or Wetland? Enter the name

About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978504

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
SPECIES	Piping Plover	Charadrius melodus	S1B	END	END	2009-07-20	332	http://nhic.mnr.gov.on.ca/re
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-16	4919	
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

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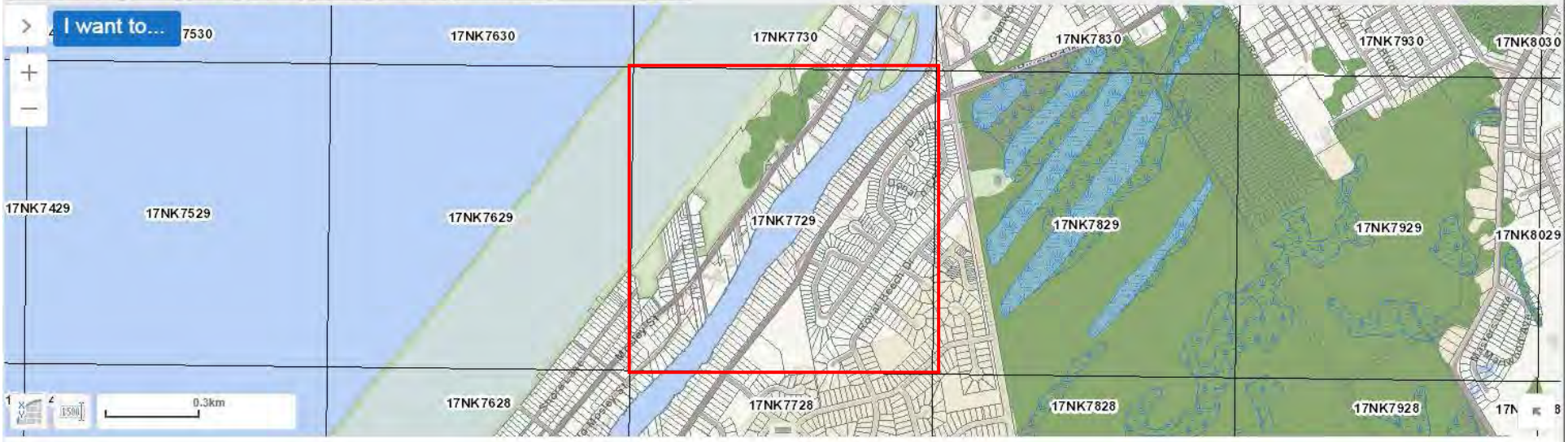

NHIC Data – Grid ID = 978413

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Prairie Warbler	Setophaga discolor	S3B	NAR	NAR	1927-06-09	21550	http://nhic.mnr.gov.on.ca/re
SPECIES	Woodland Pinedrops	Pterospora andromedea	S2			1948-07-28	33969	http://nhic.mnr.gov.on.ca/re
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

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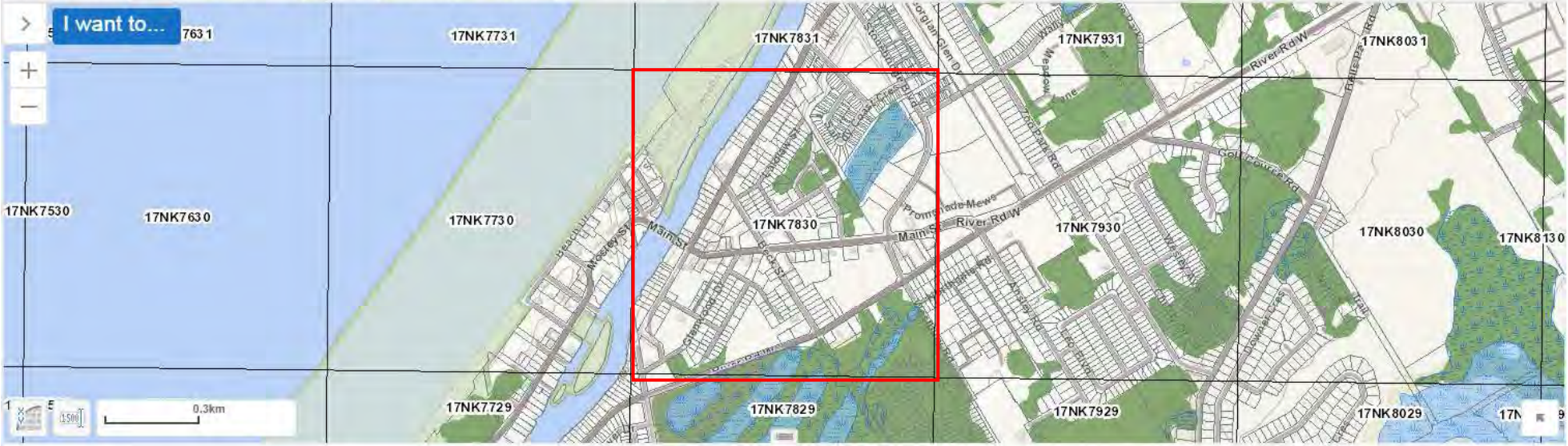
About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978514

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
SPECIES	Piping Plover	Charadrius melodus	S1B	END	END	2009-07-20	332	http://nhic.mnr.gov.on.ca/re
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-10-12	95737	http://nhic.mnr.gov.on.ca/re
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

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Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help

NHIC Data – Grid ID = 978423

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Spotted Wintergreen	Chimaphila maculata	S2	END	THR	1995-00-00	5506	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Woodland Pinedrops	Pterospora andromedea	S2			1948-07-28	33969	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-10-12	95737	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Rusty-patched Bumble Bee	Bombus affinis	S1	END	END	1941-08-21	116071	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid

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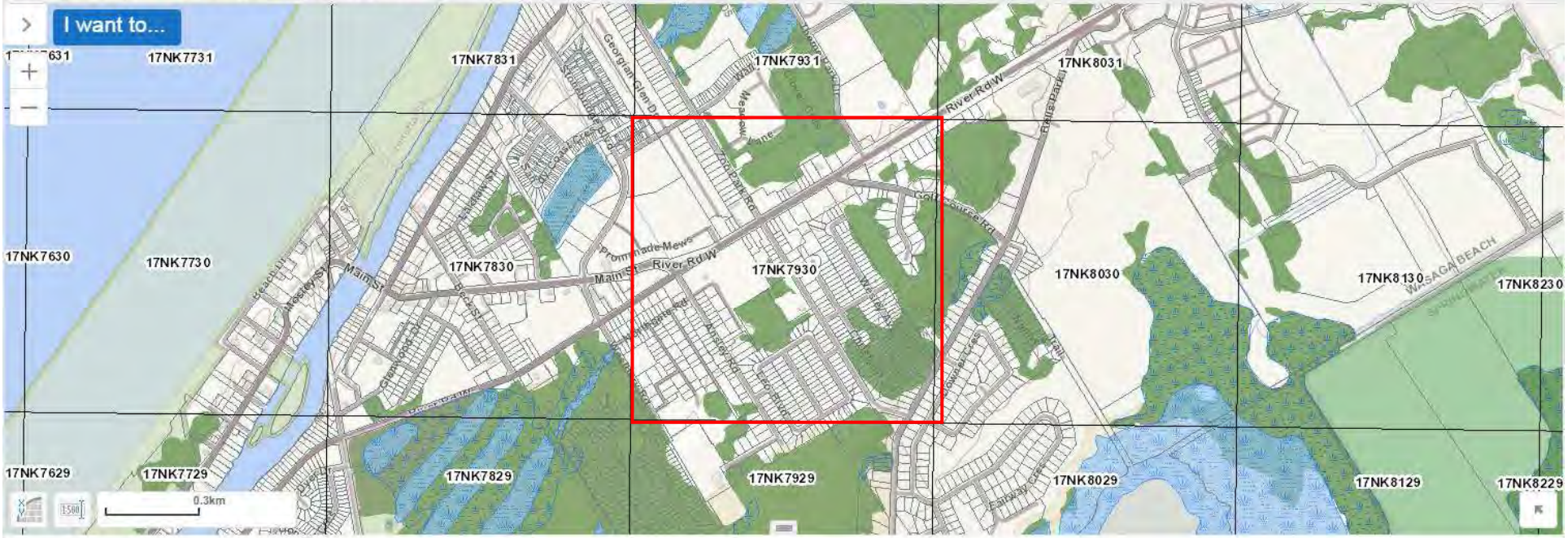
Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978524

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	

[Français]

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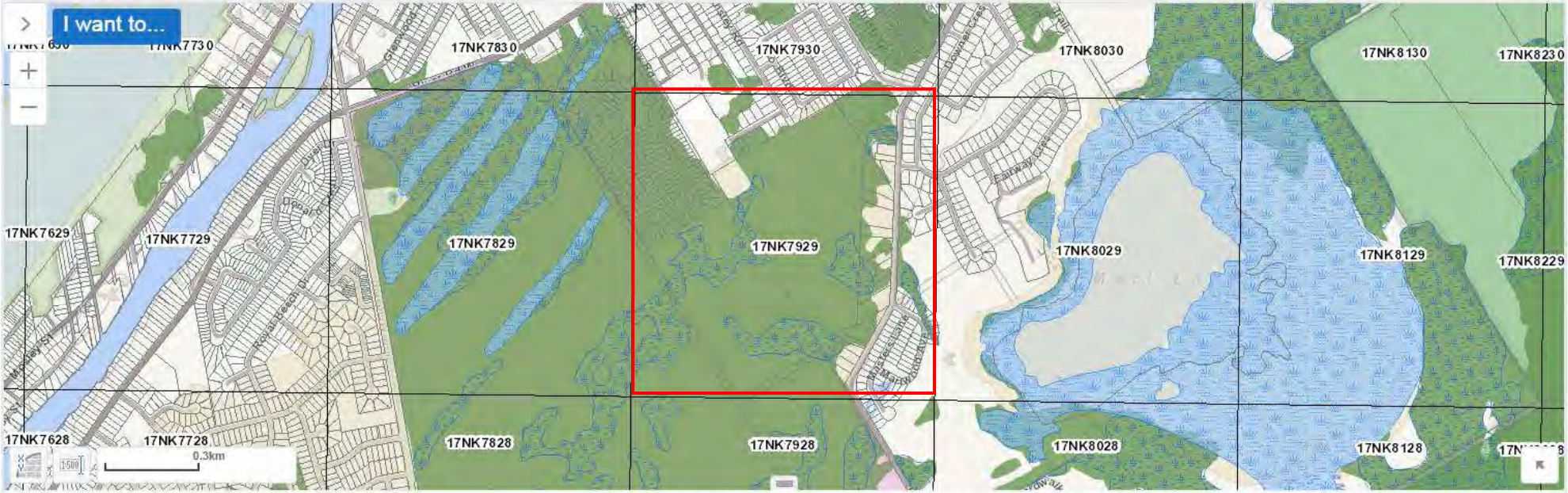
Looking for a Park, Reserve or Wetland? Enter the name

About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978433

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Spotted Wintergreen	Chimaphila maculata	S2	END	THR	1995-00-00	5506	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgriddetail&

From: Jason Runtas
Sent: Tuesday, December 03, 2019 10:48 AM
To: 'SAROntario@ontario.ca'
Subject: FW: Information Request for Main Street Revitalization - Class EA
Attachments: 18-351 MECP Information Request .pdf

Good afternoon,

I am writing this email to confirm that you have received the request below. I am wondering if you could provide me with an anticipated timeline for when I may receive a response.

Thanks,

Jason

From: Jason Runtas
Sent: Tuesday, October 22, 2019 9:15 AM
To: 'SAROntario@ontario.ca'
Subject: Information Request for Main Street Revitalization - Class EA

To whom it may concern,

Azimuth has been retained to provide natural heritage services toward a Schedule "C" Municipal Class Environmental Assessment for proposed improvements to Main Street from River Road West to Mosley Street, as well as Mosley Street from Main Street to 6th Street and Beach Drive, in the Town of Wasaga Beach.

We ask that you review the information package attached and confirm that the consolidated list of SAR expected to occur on the property and/or adjacent lands (*i.e.* up to 120m) includes all SAR of concern to the MECP. Additionally, we would like to take this opportunity to request any additional information related to natural heritage (including SAR and fisheries) on the property and adjacent lands that has not been made publically available.

Thank you and should you have any questions, do not hesitate to contact.

Kind regards,

Jason

Jason Runtas H.B.Sc.

Ecologist

Azimuth Environmental Consulting, Inc.
642 Welham Road, Barrie, ON, L4N 9A1
ph: (705) 721-8451 ext 228
cell: (705) 795-8451

jason@azimuthenvironmental.com
www.azimuthenvironmental.com

Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering

Jason Runtas H.B.Sc.

Ecologist

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jason@azimuthenvironmental.com
www.azimuthenvironmental.com

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From: Jason Runtas
Sent: Tuesday, December 10, 2019 10:31 AM
To: 'SAROntario@ontario.ca'
Subject: FW: Information Request for Main Street Revitalization - Class EA
Attachments: 18-351 MECP Information Request .pdf

Good afternoon,

I am sending this email as a follow up to the one below to ensure the info request has been received.

Thank you for your consideration,

Jason

From: Jason Runtas
Sent: Tuesday, October 22, 2019 9:15 AM
To: 'SAROntario@ontario.ca'
Subject: Information Request for Main Street Revitalization - Class EA

To whom it may concern,

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cell: (705) 795-8451
jason@azimuthenvironmental.com
www.azimuthenvironmental.com

Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering

From: Species at Risk (MECP) [SAROntario@ontario.ca]
Sent: Wednesday, July 10, 2019 3:47 PM
To: Jason Runtas
Subject: RE: Information Request for Joanne Crescent NHE
Attachments: DRAFT_Eastern Hog-nosed Snake_RS_Sept11.pdf

Hi Jason,

The RS 4919 is E. Hog-Nosed Snake. I recommend that you review the EHN Recovery Strategy and look for important habitat features in your field work. You should strive to maintain the existing treed corridor in this area. Please find attached list of possible SAR in Wasaga Beach.

SPECIES AT RISK IN THE TOWN OF WASAGA BEACH

Status for species as per the provincial **Species at Risk in Ontario (SARO) List**
SARO List -http://www.ontario.ca/environment-and-energy/species-risk

END - Endangered, **THR** - Threatened, **SC** - Special Concern

TAXA	SPECIES	STATUS (as of Jun 2016)	DESCRIPTION OF HABITAT USED	HABITAT PROTECTION UNDER ESA
Birds	Barn Swallow	THR	nest on ledges or walls in and outside of barns and other man made structures including buildings and bridges, may also use natural cliffs and caves.	General
Birds	Bank Swallow	THR	nest colonially in burrows, natural and human-made settings where there are vertical faces in silt and sand deposits, may nest on banks of rivers and lakes but can also be found in active or former sand and gravel pits	General
Bird	Black Tern	SC	large cattail marshes in wetlands	N/A
Bird	Bobolink	THR	hayfields and grassland habitats, pastures and some crop lands	General
Bird	Canada Warbler	SC	deciduous and coniferous forests, usually wet forest types with a well developed, dense shrub layer	N/A
Bird	Chimney Swift	THR	in and around urban settlements where they nest and roost in chimneys and other vertical manmade structures, will also use hollow trees or tree cavities in older growth forests, often near water	General
Bird	Common Nighthawk	SC	open areas with little to no ground vegetation, such as forest clearings, rock barrens, peat bogs, lakeshores and logged or burned over areas	N/A
Birds	Eastern Meadowlark	THR	native grasslands, pastures, agricultural fields especially in alfalfa and hay, old fields, meadows	General
Birds	Eastern Wood-Pewee	SC	intermediate-age mature forest stands with little understory vegetation, edges of deciduous and mixed forests	N/A
Bird	Golden-winged Warbler	SC	areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas	N/A
Bird	Grasshopper Sparrow	SC	prefers drier, sparsely vegetated grasslands, particularly rough or unimproved pastures at least 30 hectares in size supporting varying amounts of forbs and shrubs	N/A

Bird	Least Bittern	THR	large, quiet marshes with cattails	General
Bird	Olive-sided Flycatcher	SC	coniferous or mixed forest adjacent to wetlands or rivers	N/A
Bird	Piping Plover	END	wide open beaches along Lake Huron and Southern Georgian Bay shoreline	General
Bird	Red-headed Woodpecker	SC	nests in cavities in dead or mature trees, open woodland and woodland edges, especially in oak savannahs and riparian forest and habitats which contain a high density of dead trees,	N/A
Bird	Short-eared Owl	SC	open areas such as grasslands, marshes, wet meadows, fields and forest clearings	N/A
Bird	Whip-poor-will	THR	open woodlands or openings in mixed forests, rock or sand barrens with scattered trees, savannahs	General
Bird	Wood Thrush	SC	mature deciduous and mixed forests, moist stands of trees with developed undergrowth, prefer large forests, nests in live saplings, trees or shrubs	N/A
Fish	Lake Sturgeon	THR	inhabits the bottoms of shallow areas of large freshwater lakes and rivers, spawns in the Nottawasaga River	General
Insect	Monarch Butterfly	SC	wherever there are milkweed plants and wildflowers, often found in old fields, abandoned farmland and roadsides	N/A
Mammals	American Badger	END	found in remnant tallgrass prairie, sand barrens and farmland, wooded areas adjacent to farmland and ravines	Regulated
Mammal	Eastern Small-footed Bat	END	roost under rocks, rock outcrops, in buildings, under bridges or in caves, mines or hollow trees	General
Mammal	Little Brown Bat	END	roost in trees or buildings during the day, often select attics, abandoned buildings and barns for summer colonies. Hibernate in caves and abandoned mines	General
Mammal	Northern Long-eared Bat	END	roost under loose bark and in the cavities of trees, hibernate in caves or abandoned mines	General
Mammal	Tri-coloured Bat	END	found in a variety of forested habitats, maternity colonies may found in trees, rock crevices, and barns or other buildings. Hibernate in caves, mines and tunnels.	General
Plant	Butternut	END	found in variety of sites, commonly in forest openings, old fields, hedgerows, on floodplains, stream sides or gradual slopes.	General
Plant	Hill's Thistle	THR	open sunny sites, including prairies and woodland alvars.	General
Plant	Spotted Wintergreen	END	dry, oak-pine woodland habitats with sandy soils	General
Reptile	Eastern Hog-nosed Snake	THR	sandy, well-drained habitats including dry woods, open sandy areas, fields and shrublands and wetlands	General
Reptile	Eastern Musk Turtle (Stinkpot)	SC	shallow, slow-moving water around Georgian Bay	N/A
Reptile	Northern Map Turtle	SC	large rivers and lakes	N/A
Reptile	Snapping Turtle	SC	very aquatic species, spend most of their lives in water, prefers shallow water in wetland habitats.	N/A

Jody Scheifley
Management Biologist | Permissions and Compliance Section, Species at Risk Branch
Ministry of Environment, Conservation and Parks
519-371-8422
1450 7TH Avenue East Owen Sound, Ontario, N4K 2Z1

From: Jason Runtas <jruntas@azimuthenvironmental.com>
Sent: July 5, 2019 8:59 AM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: Information Request for Joanne Crescent NHE

To whom it may concern,

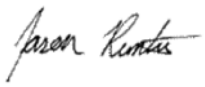
Azimuth has been retained to complete a Natural Heritage Evaluation for a property located in Part of Lot 32, Concession 1 (Joanne Crescent), Town of Wasaga Beach.

We ask that you review the information package attached and confirm that the consolidated list of SAR expected to occur on the property and/or adjacent lands (*i.e.* up to 120m) includes all SAR of concern to the MECP. Additionally, we would like to take this opportunity to request any additional information related to natural heritage (including SAR and fisheries) on the property and adjacent lands that has not been made publically available.

A restricted species was identified during a review of NHIC's mapping software in square 17NK7124. The EO ID for this species is 4919. Azimuth will protect the identity of "Restricted" SAR within our report that could potentially be made publically available.

Thank you and should you have any questions, do not hesitate to contact.

Kind regards,



Jason Runtas H.B.Sc.

Ecologist

Azimuth Environmental Consulting, Inc.
642 Welham Road, Barrie, ON, L4N 9A1
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cell: (705) 795-8451
jason@azimuthenvironmental.com
www.azimuthenvironmental.com

APPENDIX C

NVCA Terms of Reference

From: Mike Francis [mfrancis@nvca.on.ca]
Sent: Wednesday, October 23, 2019 8:42 AM
To: Jason Runtas
Cc: Lee Bull
Subject: RE: 18-351 Terms of Reference Confirmation - Main Street - Town of Wasaga Beach

Hi Jason:

Thanks for your email and for circulating NVCA on the proposed study scope.

I have no objections to the scope listed below. If the study limits encompass any naturally-occurring vegetation communities, I recommend that your ELC exercise be conducted 'in season' and by someone with knowledge and expertise in identification of locally-relevant rare vascular plants.

Feel free to call with any additional questions.

Mike Francis, H.B.Sc., M.E.S., E.P. | Planning Ecologist

Nottawasaga Valley Conservation Authority
8195 8th Line, Utopia, ON L0M 1T0
T 705-424-1479 ext. 236 | **F** 705-424-2115
mfrancis@nvca.on.ca | **nvca.on.ca**

From: Jason Runtas [mailto:jruntas@azimuthenvironmental.com]
Sent: Friday, October 18, 2019 4:07 PM
To: Mike Francis <mfrancis@nvca.on.ca>
Subject: 18-351 Terms of Reference Confirmation - Main Street - Town of Wasaga Beach

Hi Mike,

Azimuth Environmental Consulting, Inc. has been retained as a sub consultant to the project team to complete the natural heritage evaluation concerning a Municipal Class Environmental Assessment (EA) Study, Schedule 'C' for the revitalization of Main Street from River Road West to Mosley Street as well as Mosley Street from Main Street to 6th Street and Beach Drive in the Town of Wasaga Beach. We are contacting you/the NVCA to establish a Terms of Reference for works to define existing conditions for the natural heritage evaluation. Attached please find a Figure showing the general study area (outlined in red).

Azimuth is proposing to undertake the following activities to fulfill objectives of this study:

- Obtain background information and mapping related to natural heritage features and functions for the study area through a combination of on-line searches of Simcoe County, Land Information Ontario, MNRF's NHIC database, etc. and information request submissions to the MNRF (natural heritage features and functions data), and MECP (SAR information); Note: we assume that project engineers will be contacting the NVCA with respect to natural hazards.
- Classify vegetation communities of the study area using the methods of the Ecological Land Classification System for southern Ontario to the extent possible given the urban nature of the are based on data collected in autumn 2019;
- Compile a list of wildlife encountered;
- Complete SAR assessment;
- Complete an aquatic habitat assessment to document site conditions at the Main St. bridge crossing

Please advise if the above noted activities are deemed sufficient to define existing conditions for the natural heritage evaluation component of the EA from NVCA's perspective. If not, please modify the list as required.

Best regards,

Jason Runtas H.B.Sc.

Ecologist

Azimuth Environmental Consulting, Inc.

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Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering

Environmental Impact Study

Main Street, Mosley Street and Beach Drive

Road Improvements Municipal Class EA

Prepared for:
Tatham Engineering Limited

Prepared by:
Azimuth Environmental
Consulting, Inc.

January 2021

AEC 18-351

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

January 29, 2021 AEC 18-351

Tatham Engineering Limited
41 King Street, Unit #4
Barrie, Ontario
L4N 6B5

Attention: David Perks, M.Sc., PTP, Transportation Planner & Project Manager

Re: **Environmental Impact Study for a Municipal Class EA - Main Street, Mosley Street and Beach Drive Road Improvements, Town of Wasaga Beach**

Dear Mr. Perks:

As requested, Azimuth Environmental Consulting, Inc. has prepared an Environmental Impact Study for a proposed road improvements and revitalization project in the Town of Wasaga Beach. The following report presents natural heritage existing conditions and the results of our impact assessment relative to the proposed alternatives. Based on our assessment, there is no expectation that the proposed road improvements will impact negatively natural heritage features and functions, providing recommended mitigation measures are implemented.

If you have any questions or require additional information, please do not hesitate to contact the undersigned.

Yours truly,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Dr. Scott Tarof, Ph.D. (Biology)
Terrestrial Ecologist

Sara Murphy, B.Sc.
Fisheries Ecologist/Partner

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1.0 INTRODUCTION

Azimuth Environmental Consulting, Inc. (Azimuth) was retained by Tatham Engineering Limited (Tatham) to complete an Environmental Impact Study (EIS) pertaining to proposed road improvements in the Town of Wasaga Beach (Town). Scope of the road improvements includes alterations to corridors of Main Street, Mosley Street and Beach Drive (study area; Figure 1).

It is our understanding that the project is being completed in accordance with a Schedule 'C' Municipal Class Environmental Assessment (Class EA) undertaking, and that the Town requires an EIS to assess potential direct and indirect impacts of proposed road improvements on Natural Heritage Features and Functions (NHFFs). The impact assessment focuses on potential impacts to NHFFs including Species at Risk (SAR) protected under Ontario's ***Endangered Species Act***, 2007 (ESA), Significant Wildlife Habitat (SWH), wetlands, woodlands and rare habitat. The purpose of the EIS is threefold: (1) identify NHFFs that could be impacted by the proposed improvements; (2) complete an impact assessment to inform selection of the preferred design; and (3) make recommendations for impact avoidance/minimization/mitigation.

A combination of background information and data collected by Azimuth during 2019 fieldwork are used to address potential impacts associated with proposed road improvements. Policies and regulations associated with NHFFs considered in this EIS are derived from those outlined in the Provincial Policy Statement (PPS) (MMAH, 2020), ESA, County of Simcoe (County) Official Plan (OP, 2016) and Town Official Plan (2020).

2.0 PLANNING CONTEXT

2.1 Provincial Planning Policy (2020)

The Provincial Policy Statement (MMAH, 2020) outlines policies related to natural heritage features. Ontario's ***Planning Act*** (2001) requires that planning and development decisions are consistent with the PPS. The following policies are relevant to this project.

According to Section 2.1.4, "development and site alteration shall not be permitted in:

- Significant wetlands in Ecoregions 5E, 6E and 7E; and
- Significant coastal wetlands."

According to Section 2.1.5, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in:

- Significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Significant valleylands Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Significant Wildlife Habitat; and
- Significant Areas of Natural and Scientific Interest (ANSI).

According to Section 2.1.6, development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

As per Section 2.1.7, development and site alteration shall not be permitted in habitat of Endangered (END) or Threatened (THR) species, except in accordance with federal and provincial policy.

Section 2.1.8 states that "development and site alteration shall not be permitted on lands adjacent to the natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands have been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions."

In regard to natural heritage features, the PPS defines 'negative impact' as "degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple or successive development or site alteration activities."

2.2 Endangered Species Act (2007)

Ontario's ESA provides regulatory protection to END and THR species, prohibiting harassment, harm and/or killing of individuals and destruction of their habitats. Habitat is broadly characterized within the ESA as the area prescribed by a regulation as the habitat of the species or an area on which the species depends, directly or indirectly, to carry on its life processes including reproduction, rearing of young, hibernation, migration or feeding.

The various schedules of the ESA identify SAR in Ontario. These include species listed as Extirpated (EXT), END, THR and Special Concern (SC). As noted above, only species listed as END or THR receive protection through the ESA from harm and destruction to habitat on which they depend. Species designated as SC may receive protection under SWH provisions of the PPS.

According to Section 9.(1)(a), no person shall kill, harm, harass, capture or take a living member of a species that is listed in Ontario Regulation (O. Reg.) 230/08 as an EXT, END or THR species.

Section 10.(1) of the ESA prohibits damage to habitat stating that no person shall damage or destroy the habitat of a species that is listed in O. Reg. 230/08 as an END or THR species.

As per Section 17.(1), the Minister may issue a permit to a person that, with respect to a species specified in the permit that is listed in O. Reg. 230/08 as an EXT, END or THR species, authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by Section 9 or 10.

2.3 Federal Fisheries Act

On August 28, 2019, provisions of the federal ***Fisheries Act*** came into force that included new protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. The Act provides protection against the 'death of fish, other than by fishing', [Section 34.4(1)] and the 'harmful alteration, disruption or destruction of fish habitat' (HADD) [Section 35(1)].

If the death of fish, and/or HADD is likely to result from a project, the project will require an authorization from Fisheries and Oceans Canada (DFO) as per Paragraph 34.4(2)(b) or 35(2)(b) of the ***Fisheries Act*** Regulations. The fish and fish habitat protection provisions of the ***Fisheries Act*** are documented in the Fish and Fish Habitat PPS, which outlines how DFO will implement these provisions. The process of fisheries review is currently being revised as DFO unveils codes of practice. In the meantime, projects are being reviewed to determine potential impacts to fish and fish habitat, requirements for mitigative strategies to eliminate impacts, and determine approval requirements. Projects that take place near or in water have the potential to impact fish and fish habitat and should be reviewed by a qualified fisheries ecologist to determine applicable permit requirements from DFO.

2.4 County of Simcoe

According to Schedule 5.1 of the County OP (2016), the study area is in a land use area designated as "Settlements" (Appendix A). Development may be approved in Settlements, in accordance with policy Section 3.5.9.

2.5 Town of Wasaga Beach

According to Schedule A-10 of the Town OP (2020), the study area is located within the following land use areas: Downtown Gateway; Downtown Core; Natural Hazards; the Beach and Open Space (Appendix B).

As per policy Section 22.3.7.1.4 (c) "The Town recognizes that in some existing areas, the reconstruction of roads to the standards required by the policies of this Plan may be economically or physically infeasible as a result of constraints of existing buildings, existing services, access driveways and other conditions. In order to secure needed road improvements in such cases, it may be necessary to find a realistic balance between accepted engineering standards and the disruptive effects upon existing conditions."

2.6 Nottawasaga Valley Conservation Authority

As per O. Reg. 172/06, portions of the study area (northeast corner near Wood Avenue, Main Street Bridge area encompassing the Nottawasaga River, Beach Drive and surrounding lands) are within the Regulation Limit of the Nottawasaga Valley Conservation Authority (NVCA) (Appendix C). A development permit may be required.

3.0 STUDY APPROACH

3.1 Study Area

The study area is located in Ecoregion 6E and includes corridors of Main Street (from River Road West to the west side of the Nottawasaga River), Mosley Street (southwest from the intersection of Main Street and Spruce Street/Janetta Street to 6th St.) and Beach Drive (northeast along the shoreline of Nottawasaga Bay between 3rd Street and Spruce Street) (Figure 1). Azimuth's fieldwork in the study area focused on features within the Right-of-Way (ROW), while also considering environmental sensitivities and connections on adjacent public and private lands beyond the ROW.

For the purposes of this EIS, the term "adjacent lands" refers to those lands located outside the study area boundary but within 120 metres (m) of the study area. This definition is consistent with recommendations within the Natural Heritage Reference Manual (OMNR, 2010). Adjacent lands may be pertinent when certain NHFFs are dependent on the contiguous natural cover beyond the boundaries of the study area.

3.2 Terms of Reference

A Terms of Reference (TOR) was developed and approved with the NVCA to define the scope of work for the proposed undertaking (Appendix D).

3.3 Background Data

Background information reviewed for completing this EIS included:

- Aerial images (Google Earth, Simcoe County GIS);
- Ministry of Natural Resources and Forestry's (MNRF) Natural Heritage Information Centre (NHIC) Make-A-Map: Natural Heritage Areas application [website];
- VuMap Interactive Mapping [website];
- Ontario Breeding Bird Atlas [website];
- Ontario Reptile and Amphibian Atlas [website];
- Atlas of the Mammals of Ontario (Dobbyn, J. 1994);
- Land Information Ontario (LIO) database [website];
- Fisheries and Oceans Canada (DFO) SAR Interactive Mapping [website];
- Fish ON-Line Interactive Mapping [website];
- NVCA's Fisheries Habitat Management Plan (FHMP) (NVCA, 2009);
- Ministry of the Environment, Conservation and Parks (MECP) Species at Risk in Ontario (SARO) list (O. Reg. 230/08 - updated to August 1, 2018);
- County OP (2016); and
- Town OP (2020).

3.4 Vegetation Community Mapping

A high-level classification of vegetation community types using Ecological Land Classification (ELC) field methods (Lee 2008, Lee ***et al***. 1998) was undertaken on October 29, 2019 (temperature 15ºC; Beaufort Wind Scale: 2-3; precipitation: none; cloud cover: 40-90%; surveyor: Scott Martin) during a period prior to snow cover when vascular plant species remained identifiable. The ELC survey emphasized identification of any federally or provincially designated SAR or their habitats. Study area conditions were photographed (Appendix E).

To describe vascular plant species composition, a plant survey was conducted as a roving search to compile a list of species by ELC polygon. The plant survey included screening for SAR plants that could potentially be in the study area, such as Butternut (***Juglans cinerea***) (END) which is protected under the ESA. Tables 1 and 2 describe the ELC vegetation communities and list the vascular plant species identified, respectively.

3.5 General Wildlife Survey

Incidental observations of wildlife were collected to provide additional information related to species using the study area (temperature 15ºC; Beaufort Wind Scale: 2-3; precipitation: none; cloud cover: 40-90%; surveyor: S. Martin). Wildlife species were

identified through direct observation and interpretation of indirect signs (***i.e.***, tracks, scats, vocalizations).

3.6 Significant Wildlife Habitat

Significant wildlife habitat (SWH) was identified, where applicable, as outlined within the Significant Wildlife Habitat Technical Guide (OMNR, 2000) and the Significant Wildlife Habitat Criteria Schedules for 6E (MNRF, 2015).

3.7 Species at Risk

A SAR background information request was submitted to MECP on October 21, 2019; a response was received on December 15, 2020 (Appendix F). Results of this request provided a consolidated list of SAR having potential to occur in the study area and/or on adjacent lands based on background data sources (Appendix F).

Azimuth conducted a SAR assessment to evaluate the potential for the study area and/or adjacent lands to function as SAR habitat based on existing habitat characteristics. In consultation with MECP, Azimuth generated a consolidated list of SAR with the potential to occur. Next, Azimuth compared the consolidated list against potential SAR known to occur in the Town (provided by MECP) with habitat conditions to determine comprehensively if habitat for SAR had the potential to occur in and/or adjacent to the study area (Table 3). Azimuth included THR and END species in the SAR assessment because these species and their habitats are protected under the ESA. Special Concern species are considered as part of the SWH assessment.

3.8 Fisheries and Aquatic Habitat Assessment

Background reference documents, such as the FHMP (NVCA, 2009) and online fisheries information sources [NHIC SAR query of 1 kilometre (km) grid squares 17NK7730, 17NK7729 and 17NK7830, DFO Aquatic SAR Mapping, Fish ON-Line – Appendix C] were used as the basis of the aquatic fish habitat assessment for the study area.

4.0 EXISTING CONDITIONS

4.1 Land Use

4.1.1 On-site Land Use

The study area is situated in the downtown core of the Town of Wasaga Beach, an area that has been heavily urbanized and subjected to anthropogenic disturbance. Main Street and Mosley Street are dominated by commercial land use with some residential lots. Very little natural tree cover or other habitat remains along these two roads (Figure 2a, b, respectively). Beach Drive is primarily commercial land use on the southeast side of the

road, and beachfront adjacent to the shore of Nottawasaga Bay on the northwest side (Figure 2b). The Nottawasaga River flows under the Main Street Bridge in a northeastern direction before discharging into Nottawasaga Bay (Figure 1, 2a, b).

4.1.2 Adjacent Land Use

At the landscape scale, lands adjacent to the study area are primarily commercial. Some remnant woodlands and areas of wetland are present (Figure 2a, b), as described below.

4.2 General Topography and Soils

Topography of the study area slopes gently from the intersection of Main Street and River Road West (elevation approximately 185mASL) to Beach Drive (elevation approximately 180mASL) (VuMap).

Soils are generally well-drained, nutrient-poor, very fine sand.

4.3 Vegetation Communities

Six ELC vegetation communities were documented (Figure 2a, b; see Appendix E for photographs). Table 1 describes each delineated ELC polygon. Most ELC polygons were under 0.5 hectares (ha) in size, and thus, do not qualify as having official vegetation community status according to ELC protocols.

The sandy beach of the Mineral Open Shoreline Ecosite (SHOM1) extends along the Nottawasaga Bay shoreline to the western limit of the commercial shoreline region of Wasaga Beach (Figure 2b; Appendix E photographs 5-6). A Balsam Poplar Treed Sand Dune (SBTD1-2) occupies the beachfront foredune adjacent to the open Nottawasaga Bay shoreline (Figure 2b). This provincially rare (S1) community is dominated by Balsam Poplar and American Beech Grass.

One hundred and twenty-five vascular plant species were identified (Table 2). No Butternut trees were found. None of the plant species are designated as SAR or considered provincially rare (***i.e.***, no S rank 1, 2, 3 or H). Fifty-two of the 125 plant species (42%) are non-native to Ontario.

4.4 Wetlands

The Wasaga Beach WB1 Provincially Significant Wetland (PSW) was observed in the field northeast of Wood Avenue. This PSW extends southwest of the River Road West and Stonebridge Boulevard intersection (Figure 2a).

4.5 Woodlands

The majority of historic woodlands in and adjacent to the study area have been cleared for development. There are some remnant patches of woodlands in the study area bordering connecting streets [***i.e.***, Wood Avenue (FOMM10-2, Figure 2a)].

4.6 General Wildlife

Based on field observations, proximity of the study area to the Nottawasaga River and Wasaga Beach Provincial Park, and the highly urbanized landscape, the following mammal species are presumed to be present in the study area: Common Coyote (***Canis latrans***), Eastern Grey Squirrel (***Sciurus carolinensis***), Raccoon (***Procyon lotor***), Red Squirrel (***Tamiasciurus hudsonicus***), Beaver (***Castor canadensis***), Red Fox (***Vulpes vulpes***), Striped Skunk (***Mephitis mephitis***), Virginia Opossum (***Didelphis virginiana***), White-tailed Deer (***Odocoileus virginianus***), Eastern Chipmunk (***Tamias striatus***) and various shrews, mice and voles. None of the species are rare or SAR.

4.7 Species at Risk

No SAR were found during the October 29, 2019 field survey in the study area or on adjacent lands.

4.8 Fisheries and Aquatic Habitat

The project area includes the Nottawasaga River crossing at Main Street, shoreline of the Nottawasaga River adjacent to Mosley Street, and shoreline of Georgian Bay to the west (Figure 1). The study area contains the main branch of the Nottawasaga River, which flows under the Main Street Bridge in a northeasterly direction before discharging into Nottawasaga Bay, part of greater Georgian Bay. The Main Street Bridge connects Main Street to Mosley Street and is located approximately 2km upstream of the outlet of the Nottawasaga River to Georgian Bay (Figure 2a, b). In the project area the river forms an important component of the Town's economic industry providing recreational opportunities for local residents and seasonal visitors, and waterfront shoreline for a variety of residents and seasonal businesses.

The Nottawasaga River provides spawning habitat for many species of fish, including Lake Sturgeon (provincially designated END, federally designated THR - Great Lakes/Upper St. Lawrence River populations), which migrate up to 70km upstream into the Nottawasaga River watershed that encompasses an area of 3,000km^2. The river also has potential to provide habitat for Silver Lamprey, (provincially and federally designated SC) which may use the river's soft sandy substrate for spawning and early development life stages.

In accordance with NVCA's FHMP (NVCA, 2009), Wasaga Beach is within the Lower Nottawasaga River Reach and Tributaries of Fisheries Habitat Management Unit 1, (FHMU 1). The FHMU is managed consistent with the protection, enhancement and restoration of a warmwater predator fisheries habitat ecosystem, and functions as a major coldwater fish migratory route. As per the FHMP, the warmwater ecosystem in the lower Nottawasaga River should be considered as an extension of the warmwater predator fisheries habitat ecosystem in the near shore portion of Nottawasaga Bay (NVCA, 2009).

The lower and middle reaches of the Nottawasaga River support one of the largest spawning populations of Lake Sturgeon in southern Ontario, one of the largest spawning populations of wild migratory Rainbow Trout and Chinook Salmon in the Great Lakes Basin, and supports one of the largest populations of wetland-spawning Walleye in North America (NVCA, 2009).

5.0 NATURAL HERITAGE FEATURES AND FUNCTIONS

5.1 General Topography and Soils

There are no valleylands (with landform prominence) or steep slopes in the study area or on adjacent lands.

5.2 Wetlands

5.2.1 Provincially Significant Wetlands

The Wasaga Beach WB1 PSW is present northeast of Wood Avenue and southwest of River Road West and Stonebridge Boulevard, consistent with background mapping (Appendix C).

5.2.2 Other Wetlands

An unevaluated wetland is present south of River Road West and west of Stonebridge Boulevard, consistent with NHIC mapping (Appendix C).

5.3 Woodlands

Consistent with NHIC and LIO mapping, Woodlands occur north of Main Street and south of River Road West (Appendix C, Figure 2a). Background mapping also showed a remnant woodland patch partially in a region of the study area associated with 5th Street and 6th Street (Appendix C, Figure 2b), however, existing conditions observed in the field (ELC polygon CGL_2 – "constructed parkland") were not consistent with this mapped Woodland designation.

5.4 Areas of Natural and Scientific Interest

No ANSI have been mapped in the study area or on adjacent lands (Appendix C).

5.5 Significant Wildlife Habitat

An assessment of SWH determined the potential for the following SWH functions to possibly be associated with the study area and/or adjacent lands based on criteria outlined in Ecoregion 6E SWH Criteria Schedules:

- Shorebird Migratory Stopover Area – Beach (Potential);
- Rare Vegetation Communities; and
    - Treed Sand Dune (SBTD1-2)
- Special Concern and Rare Wildlife Species
    - Northern Map Turtle (SC) – Nottawasaga River (Potential)
    - Snapping Turtle (SC) – Nottawasaga River (Potential)
    - Silver Lamprey (SC) – Nottawasaga River

Based on DFO background mapping, one SC fish species has been mapped within 1km of the Main Street Bridge: Silver Lamprey (Appendix C).

5.6 Habitat of Threatened and Endangered Species

Species at risk protected under the ESA (THR or END) with potential to occur in the study area and/or on adjacent lands, and their preferred habitats, were considered to provide a more comprehensive assessment as to whether or not there is potentially suitable habitat for SAR (Table 3). No SAR were identified during field investigations, however, the following species represent potential constraints to road improvements should habitat for these SAR occur in the study area and/or on adjacent lands:

- Barn Swallow (THR), Piping Plover (END);
- Little Brown Myotis (END), Northern Long-eared Myotis (END), and Tri-colored Bat (END);
- Restricted Species (THR); and
- Lake Sturgeon (END).

Background data sources indicated the presence of one “Restricted Species” with the potential to occur in the study area. The MECP verified the identity of this Restricted Species, however, due to the sensitivity of the SAR record, identity of the species cannot be disclosed. During the October 29, 2019 field survey, Azimuth’s ecologist did not observe habitat for any restricted species known to be found in Simcoe County in or adjacent to the study area.

5.7 Fisheries and Aquatic Habitat

The Nottawasaga River and Georgian Bay provide important fish and fish habitat functions, including habitat for provincially END Lake Sturgeon.

5.8 Natural Heritage Features and Functions Summary

Results of field surveys, review of background information and analysis indicate the potential for the following NHFFs to be located in the study area and/or on adjacent lands:

- Wetlands – Adjacent;
- Woodlands;
- Significant Wildlife Habitat;
    - Shorebird Migratory Stopover Area – Beach (Potential)
    - Rare Vegetation Communities
        - Treed Sand Dune (SBTD1-2)
    - Special Concern and Rare Wildlife Species
        - Northern Map Turtle (SC) – Nottawasaga River (Potential)
        - Snapping Turtle (SC) – Nottawasaga River (Potential)
        - Silver Lamprey (SC) – Nottawasaga River
- Habitat of Threatened or Endangered Species;
    - Barn Swallow (THR), Piping Plover (END)
    - Little Brown Myotis (END), Northern Long-eared Myotis (END), and Tri-colored Bat (END)
    - Restricted Species (THR)
    - Lake Sturgeon (END); and
- Fisheries and Aquatic Habitat

Our impact assessment will consider potential impacts only to features and functions summarized here, and make reference to the Natural Hazard Study by Shoreplan (2020) that considers flood risk.

6.0 PROPOSED DEVELOPMENT

Tatham has proposed road improvement alternatives involving reconstruction of sections of Main Street, Mosley Street and Beach Drive in a highly urbanized area of Wasaga Beach. The alternative options proposed and the preferred design for each of the three road corridors are shown in Appendix G and summarized in Table 4. Appendix G also shows the Ontario Parks Boundary in the context of Beach Drive.

One alternative design option has been proposed for Main Street (Figure 3a). On Mosley Street, between Spruce Street and 2nd Street, four alternative design options were

proposed, plus one alternative design option from 2nd Street to 6th Street (five alternative designs total for Mosley Street, Figure 3b). For Beach Drive, Tatham proposed four alternative design options (Figure 3b). The design alternatives are similar in terms of seeking to minimize alterations to the existing ROW and road alignment where possible. Differences among the design alternatives are associated with road widening location and whether or not the design alternatives involve realignment or shifting of the road (***i.e.***, Mosley Street, Beach Drive) (Table 4).

Of the proposed alternative design options, Tatham has brought forward a preferred design for each road corridor (Figure 4a, b; Table 4). The preferred design for road improvements includes evaluating and improving storm sanitary and watermain infrastructure, road widening within the existing ROW and/or shifting the road ROW to minimize impacts on natural heritage sensitivities. The preferred design also includes intersection improvements, pedestrian and cycling facilities, and streetscape improvements (Appendix G). At the current preliminary design stage, the extent of work that may be required in the vicinity of the Nottawasaga River is unknown.

According to the Natural Hazard Study Update for Beach Areas One and Two [Shoreplan Engineering Limited (Shoreplan), 2020], information was provided to the Town by Shoreplan regarding development encroachment considerations for Beach Drive in relation to the risk of flooding (Shoreplan, 2020; see blue 100-year Flood Line on Figure 3b, 4b).

Table 4 summarizes possible impacts to NHFFs identified by Azimuth that are associated with each alternative (discussed in Section 7.0), and ranks their respective sensitivity level (low, medium, high).

7.0 IMPACT ASSESSMENT

7.1 Wetlands

The Wasaga Beach WB1 PSW and an unevaluated wetland are present on adjacent lands but do not occur in the study area. The proposed road improvements would be limited to the existing ROW, and are anticipated to be approximately 150m or more away from these wetland features. Consequently, no wetland impacts are anticipated, providing recommended mitigation measures in Section 8.0 are followed.

7.2 Woodlands

Remnant woodlands are present in and adjacent to the study area. In regards to the small fringe of woodlands in the study area (FOMM 10-2 north of Main Street and east of Wood Avenue), the proposed preferred road improvements would not involve changes in

road alignment or footprint. This woodland fringe is also in a highly urbanized area (Figure 4a), and the extent of encroachment as a result of road improvements is anticipated to be minimal. As a result, impacts to woodlands in regards to loss of ecological function are not anticipated, providing recommended mitigation measures in Section 8.0 are followed.

7.3 Significant Wildlife Habitat

7.3.1 Shorebird Migratory Stopover Area

The Nottawasaga Bay beach area northwest of Beach Drive (SHOM1) has the potential to function as habitat for migratory shorebirds (Figure 4b). The preferred design would not involve additional encroachment of the ROW into the beach beyond existing conditions. Consequently, direct impacts to this SWH feature would not be anticipated. Implementation of Erosion and Sediment Controls (ESCs) at the time of construction would be expected to mitigate possible indirect impacts due to erosion or sedimentation (Table 4, see Section 8.0 for Recommendations).

7.3.2 Rare Vegetation Communities

The Balsam Poplar Treed Sand Dune (SBTD1-2) proximal to Beach Drive is considered a provincially rare (S1) vegetation community and is of provincial significance (Figure 4b). The preferred design proposed for Beach Drive will be outside of (but adjacent to) this vegetation community. Direct environmental impacts would not be anticipated. The potential for habitat impacts associated with any tree removals/limbing would be expected to be mitigated by following timing restriction recommendations in Section 8.0 (Table 4).

In regards to indirect impacts, the SBTD1-2 ELC polygon has been heavily disturbed by anthropogenic use. Its size, function and composition are a direct result of human disturbance. Very little natural form or function remains in the portion of the vegetation community immediately adjacent to Beach Drive (***i.e.***, in the ROW). The ROW is also removed from the majority of the community by a separation of over 40m of open sand due to wind erosion. As such, loss of any ecological function attributed to this vegetation community related to erosion or sedimentation would not be anticipated (Table 4).

7.3.3 Special Concern and Rare Wildlife Species

Evaluation of NHFFs identified three SC species with the potential to occur in and/or adjacent to the study area: Northern Map Turtle; Snapping Turtle and Silver Lamprey. These species have potential to be found in the Nottawasaga River, specifically in the portion of the study area at the Main Street Bridge (Figure 4a, b). Any proposed works in the existing ROW proximal to the river have the potential to impact, directly or

indirectly, SC species. It is our understanding that the project will not involve in-water works, so direct impacts would not be anticipated. Potential indirect impacts are expected to be mitigable through appropriate timing restrictions and ESCs, as recommended below (Table 4).

7.4 Habitat of Threatened and Endangered Species

7.4.1 Barn Swallow

Barn Swallows may nest in the study area (***e.g.***, under the Main Street Bridge or under eaves of old buildings). Barn Swallows are a well-adapted bird species to human presence, and are found regularly nesting in/on anthropogenic structures that are proximal to people. Providing the mitigation measures recommended in Section 8.0 are followed, direct and indirect impacts to Barn Swallows would be considered minimal (Table 4).

7.4.2 Piping Plover

This END species relies on large, open sandy beaches with small amounts of vegetation and vegetative debris for nesting, shelter and foraging. Piping Plovers have nested historically on the open beach (SHOM1) along Beach Drive (Figure 4b). The section of the beach where the species has nested in the past is at least 50m outside of the study area. Consequently, the proposed preferred road improvements along Beach Drive would not be expected to impact Piping Plovers or their nesting habitat, provided that construction equipment and personnel remain outside this 50m buffer. Possible indirect impacts to Piping Plover nesting habitat associated with erosion or sedimentation would be considered mitigable, providing the recommendations in Section 8.0 are followed (Table 4).

7.4.3 Endangered Bats

The preferred road improvements in the study area that are associated with roadside trees or old buildings have the potential to have direct impacts on roosting habitat of Little Brown Myotis, Northern Long-eared Myotis and/or Tri-colored bats (Figure 4a, b). Individuals of these END bat species may potentially roost in this ROW habitat in the study area. In terms of forest cover, the area of woodland habitat is small (Section 7.2 – FOMM 10-2 ELC polygon north of Main Street and east of Wood Avenue) and considered marginal in terms of its ecological function for use by bats. As such, the potential for impacts to END bats and/or their habitat in this woodland fringe is likely to be low.

The field survey resulted in observations of some low quality potential bat roost locations within the ROW in the study area (***e.g.***, single snag trees, some old buildings). Mitigation

measures are recommended in Section 8.0 to address the potential risks of the proposed works to END bats and their habitat (Table 4).

7.4.4 Restricted Species

During the October 29, 2019 field survey, Azimuth's ecologist did not observe areas of significant habitat for the Restricted Species in or adjacent to the study area. The study area is a highly urbanized environment that has been shaped by anthropogenic influences for years. Providing the development has regard for encountering any reptiles in the study area throughout construction, the risk to the Restricted Species is considered minimal and mitigable.

7.4.5 Lake Sturgeon

The preferred design on Main Street and Mosley Street proximal to the Main Street Bridge (Appendix G; Figure 4a, b, respectively) has the potential to impact Lake Sturgeon in the Nottawasaga River in the absence of mitigation. Provided there are no in-water works near the bridge, direct impacts to Lake Sturgeon can likely be mitigated. Possible indirect impacts are associated with land clearing and grading, vegetation removals, and potential for sediment and erosion and use of machinery in proximity to natural areas. All works near water and in-water should be evaluated by a qualified fisheries ecologist in future design stages to determine design implications, mitigation requirements and possible permitting under the ESA. Recommended mitigation measures are presented in Section 8.0 and Table 4.

7.5 Fisheries and Aquatic Habitat

Any project work required for road improvements within 30m of the Nottawasaga River and Georgian Bay shoreline should consider strategies for minimizing disturbance to the riparian corridor to maintain riparian vegetation integrity, work area isolation, scheduling of work to avoid sensitive life stages of fish and any project activity that involves management of surface runoff and dewatering. Stormwater controls will be required during road improvements, and any dewatering will be required to identify management of discharge before entering any waterway, to ensure that water quality criteria is met for the protection of fish and fish habitat.

7.6 Flooding Risk

Shoreplan (2020) prepared a Natural Hazard Study Update that considered the risk of flooding associated with road improvements to Beach Drive. From Shoreplan's (2020) study, the existing "paved road and lands south of (Beach Drive) prevent natural dynamic beach processes from occurring." It was determined that the "'no structures' flood hazard limit … extends beyond much of the existing development on the south side of

Beach Drive. New development south of that line would be outside the flood hazard." "Provincial policy allows for the possibility of development within the flood hazard if specific conditions are met, including compliance with floodproofing and access standards. It is our opinion that new development could be allowed within the flood hazard limit, on the south side of Beach Drive, if those standards are met with designs completed by a qualified professional engineer" (Shoreplan, 2020). Shoreplan (2020) recommended raising Beach Drive "1.2m higher than the existing average road elevation" as part of the road improvements. The study further noted that a new boardwalk on the north side of Beach Drive "is possible" … "but it must be designed for the expected wave conditions" (Shoreplan, 2020).

8.0 RECOMMENDATIONS

8.1 General Mitigation

8.1.1 Operations

In consideration of design alternatives and the potential for impacts to NHFFs, mitigation measures should be employed at all times and are recommended to include effective site/construction planning, implementation and monitoring of ESCs based on best management practices. Construction staging and refuelling areas should avoid natural areas, which include lands up to 30m from the Nottawasaga River, wetlands, woodlands, SBTD1-2 and SHOM1 ELC vegetation communities.

8.1.2 Timing Restrictions

Migratory Birds and Endangered Bats

Any vegetation removal/limbing of trees or shrubs should occur between November 1 and March 31 so as to be outside the migratory bird breeding season (April 1-August 31) and active bat roosting season (April 1-October 31). Migratory birds, nests and eggs are protected by the ***Migratory Birds Convention Act***, 1994 and the ***Fish and Wildlife Conservation Act,*** 1997. This timing restriction will mitigate the risk of possible impacts to habitat of nesting migratory birds that may be using the study area during proposed works, as well as mitigate possible impacts to potential bat snag trees that could be used by SAR bats (see also Section 8.0).

If work requires such activities be completed during the active breeding season for birds, screening by a professional ecologist with knowledge of bird species present in the area should be undertaken to ensure that the risk to impacting nesting birds has been evaluated and assumed to be low to non-existent.

Turtles

If road improvements involve in-water works near the Main Street Bridge, it is recommended that activities be conducted outside the active season for turtles (April 1 - October 31).

Fisheries

Any project activity proposed within the 2-year storm elevation of the Nottawasaga River is not permitted from March 31-July 1 in any given year to protect fish and fish habitat during sensitive times of year. Timing restrictions should be confirmed in future design stages with MNRF.

8.2 Erosion and Sediment Controls

Prior to any land clearing/earth works, the Town should develop and implement an ESC Plan to avoid/minimize risk of sediment transport or deposition of any exposed material into any sensitive natural heritage features identified (***e.g.***, SHOM1 and SBTD1-2 ELC communities, wetlands, woodlands, fish habitat in general, and in particular for END Lake Sturgeon, SC turtles and SC Silver Lamprey - Nottawasaga River). Established ESCs should isolate the limit of disturbance during all phases of construction and ensure that runoff from the study area does not impact nearby features. Erosion and sediment control measures should be monitored regularly for proper function and be maintained until improvements are complete.

8.3 Species at Risk

The study area should be surveyed by a qualified ecologist to identify any active Barn Swallow nests to avoid the risk of impacts to this SAR. If found, it would be expected that disturbance of nesting Barn Swallows can be mitigated by restricting the timing of construction in those areas to outside of the active nesting window. Construction activity that has the potential to impact Barn Swallow nesting is recommended to occur outside of the period between April 1 and August 31.

In regards to SAR bats, prior to construction, bat surveys (***e.g.***, bat snag surveys, exit surveys – as required) are recommended to determine the location of potential/confirmed bat roosting habitat. If it is determined that potential bat roosting habitat is present in the study area, timing restrictions for disturbance of the habitat would mitigate potential impacts. In this case, consultation with MECP may be advised.

Construction workers should have regard for SAR reptiles at all times during staging, refueling and construction. Construction worker training regarding SAR may be advised.

8.4 Fisheries and Aquatic Habitat

Possible disturbances to fish habitat in or adjacent to the study area should be minimized to the extent possible, and reviewed in future design stages to confirm areas of impact, requirements for mitigation and avoidance, and develop appropriate ESC Plans for the management of storm runoff and dewatering (if required for the project). As noted above, any project activity proposed within the 2-year storm elevation of the Nottawasaga River is not permitted from March 31-July 1 in a given year to protect fish and fish habitat during sensitive times of year. Timing restrictions should be confirmed in future design stages with MNRF.

Any work in NVCA regulated lands will require a work permit, and the project will require future review to confirm if impacts will result in the death of fish or HADD of fish habitat under the Federal ***Fisheries Act***. At that stage, it will be determined if a submission to DFO is required to secure permitting prior to construction. Any project activity that has the potential to impact Lake Sturgeon or their associated habitat may require permitting under the ESA. Early consultation with the NVCA, MNRF and MECP is encouraged in the subsequent design stages to confirm design requirements, mitigation strategies and permit requirements accordingly.

9.0 POLICY AND REGULATION CONFORMITY

9.1 Provincial Policy Statement (2020)

Section 2.1 – Proposed road improvements based on preferred designs result in no negative direct or indirect impacts to natural features or their ecological functions (Sections 2.1.4 and 2.1.5), including impacts to fish and fish habitat (Section 2.1.6), and can be achieved with no impact to habitat of END or THR species (Section 2.1.7). Development can be achieved with no impacts to adjacent natural heritage features (Section 2.1.8) – **Consistent**.

9.2 Endangered Species Act (2007)

Further review of works in the vicinity of the Main Street Bridge will be required to confirm compliance with the ESA as it pertains to Lake Sturgeon. For other identified species, road improvements based on preferred designs are expected to occur without impacting individuals or habitat of END or THR Ontario species – **Complies**.

9.3 Federal Fisheries Act

Road improvements based on preferred designs are not anticipated to result in a HADD, providing mitigation for study area disturbances and ESCs, as well as water quantity/quality protection provisions for runoff, are implemented. Project review should

occur in future design stages to confirm. Fisheries timing restrictions apply, and future designs should be reviewed by a qualified fisheries ecologist to identify impacts and mitigation requirements to minimize/eliminate fisheries risk, and permitting requirements of DFO and MECP – **Project has the potential to comply in future design**.

9.4 County of Simcoe

County OP Section 3.5.9 – Development may be permitted in Settlements – **Consistent**.

9.5 Town of Wasaga Beach

Town OP Section 22.3.7.1.4 (c) – Reconstruction of roads will be based on a realistic balance between accepted engineering standards and the disruptive effects upon existing conditions – **Consistent**.

10.0 CONCLUSIONS

The proposed road improvement alternatives have been reviewed from a natural heritage perspective in consultation with the design team. Based on the background information provided and Azimuth's fieldwork it is expected that the preferred alternatives can be achieved with no negative impacts to NHFFs in or adjacent to the study area, providing recommendations for impact mitigation are included in the proposal for development. Consultation and approvals may be required from the NVCA, MECP, MNRF and/or DFO for works that occur in or near NVCA-regulated lands associated with the Nottawasaga River and Georgian Bay shoreline, and will require future review in detailed design to confirm requirements.

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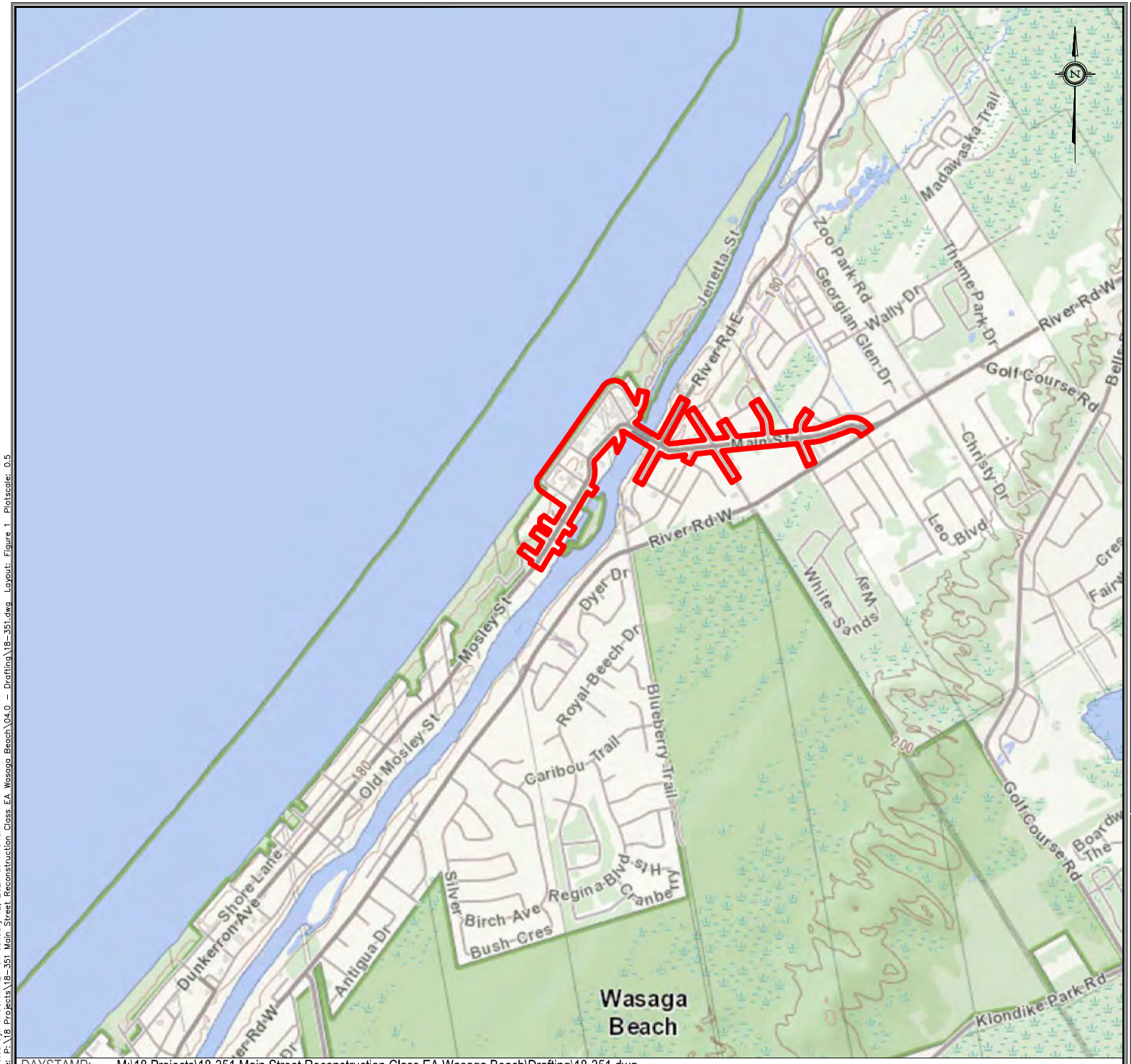

LEGEND:

Study Area

REG MAP

250m 0 750m

HORIZONTAL SCALE 1:25,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Study Area Location

Main St, Mosley St, & Beach Dr Reconstruction, Wasaga Beach, ON

DATE ISSUED: *January 2021*	Figure No.
CREATED BY: *JLM*	
PROJECT NO.: *18-351*	1
REFERENCE: *MNRF*	

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LEGEND:

- Approx. Study Area
- Watercourse
- Flow Direction
- Provincially Significant Wetland(LIO)
- Unevaluated Wetland(LIO)
- Woodland Area(LIO)
- Vegetation Communities
- CGL_2 Parkland
- FODM5-10 Dry-Fresh Sugar Maple-White Birch-Poplar Deciduous Forest Type
- FOMM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- FOMM10-2 Fresh-Moist White Spruce-Hardwood Mixed Forest Type
- MEMM3 Dry-Fresh Mixed Meadow Ecosite

50m 0 100m

HORIZONTAL SCALE 1: 3,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Road Improvements, Wasaga Beach, ON

DATE ISSUED:	December 2020	Figure No.
CREATED BY:	JLM	2a
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

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LEGEND:

- Approx. Study Area
- Watercourse
- Flow Direction
- Vegetation Communities
- CGL_2 Parkland
- FOMM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- SBTD1-2 Balsam Poplar Treed Sand Dune Type
- SHOM1 Mineral Open Shore Ecosite

50m 0 100m

HORIZONTAL SCALE 1: 3,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Mosley St. & Beach Dr. Road Improvements, Wasaga Beach, ON

DATE ISSUED:	December 2020	Figure No.
CREATED BY:	JLM	2b
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

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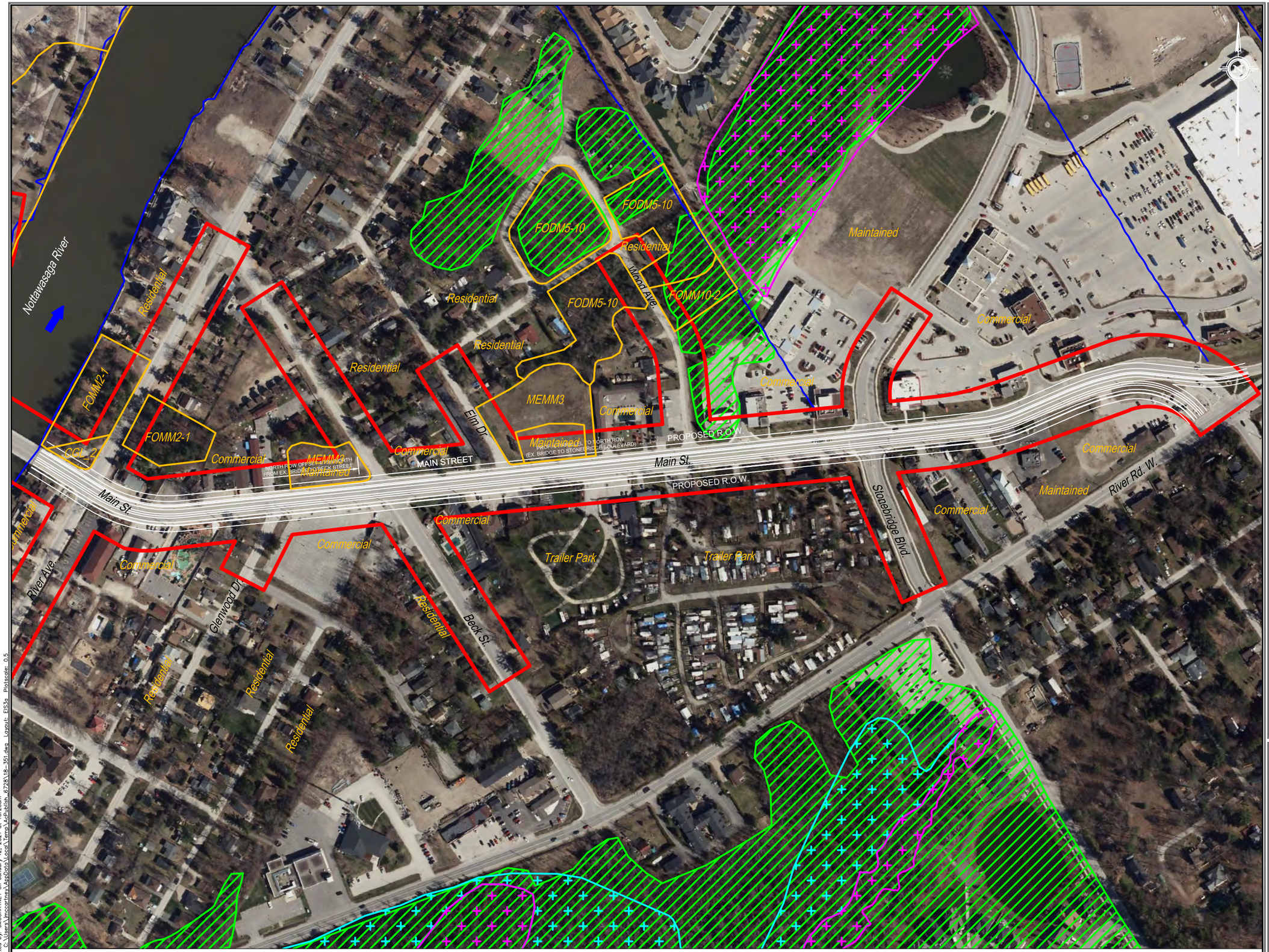

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LEGEND:

- *Approx. Study Area*
- *Watercourse*
- *Flow Direction*
- *Provincially Significant Wetland(LIO)*
- *Unevaluated Wetland(LIO)*
- *Woodland Area(LIO)*
- *Development Alternative (white)*
- *Vegetation Communities*
- CGL_2 *Parkland*
- FODM5-10 *Dry-Fresh Sugar Maple-White Birch-Poplar Deciduous Forest Type*
- FOMM2-1 *Dry-Fresh White Pine-Oak Mixed Forest Type*
- FOMM10-2 *Fresh-Moist White Spruce-Hardwood Mixed Forest Type*
- MEMM3 *Dry-Fresh Mixed Meadow Ecosite*

Note:
Main St. corridor has one alternative design.

50m 0 100m

HORIZONTAL SCALE 1: 3,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Proposed Development Alternative

Main Street Road Improvements, Wasaga Beach, ON

DATE ISSUED:	*December 2020*	Figure No. 3a
CREATED BY:	*JLM*	
PROJECT NO.:	*18-351*	
REFERENCE:	*Simcoe County Maps*	

LEGEND:

- Approx. Study Area
- Watercourse
- Flow Direction
- 100 Year Floodline (Tatham)
- No Structure Limit (Tatham)
- Development Alternatives (white & grey)
- Vegetation Communities
- CGL_2 Parkland
- FOMM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- SBTD1-2 Balsam Poplar Treed Sand Dune Type
- SHOM1 Mineral Open Shore Ecosite

Note:
Mosley St. corridor has five alternative designs.
Beach Dr. has four alternative designs.

25m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Proposed Development Alternatives

Mosley St. & Beach Dr. Road Improvements, Wasaga Beach, ON

DATE ISSUED:	December 2020	Figure No. 3b
CREATED BY:	JLM	
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

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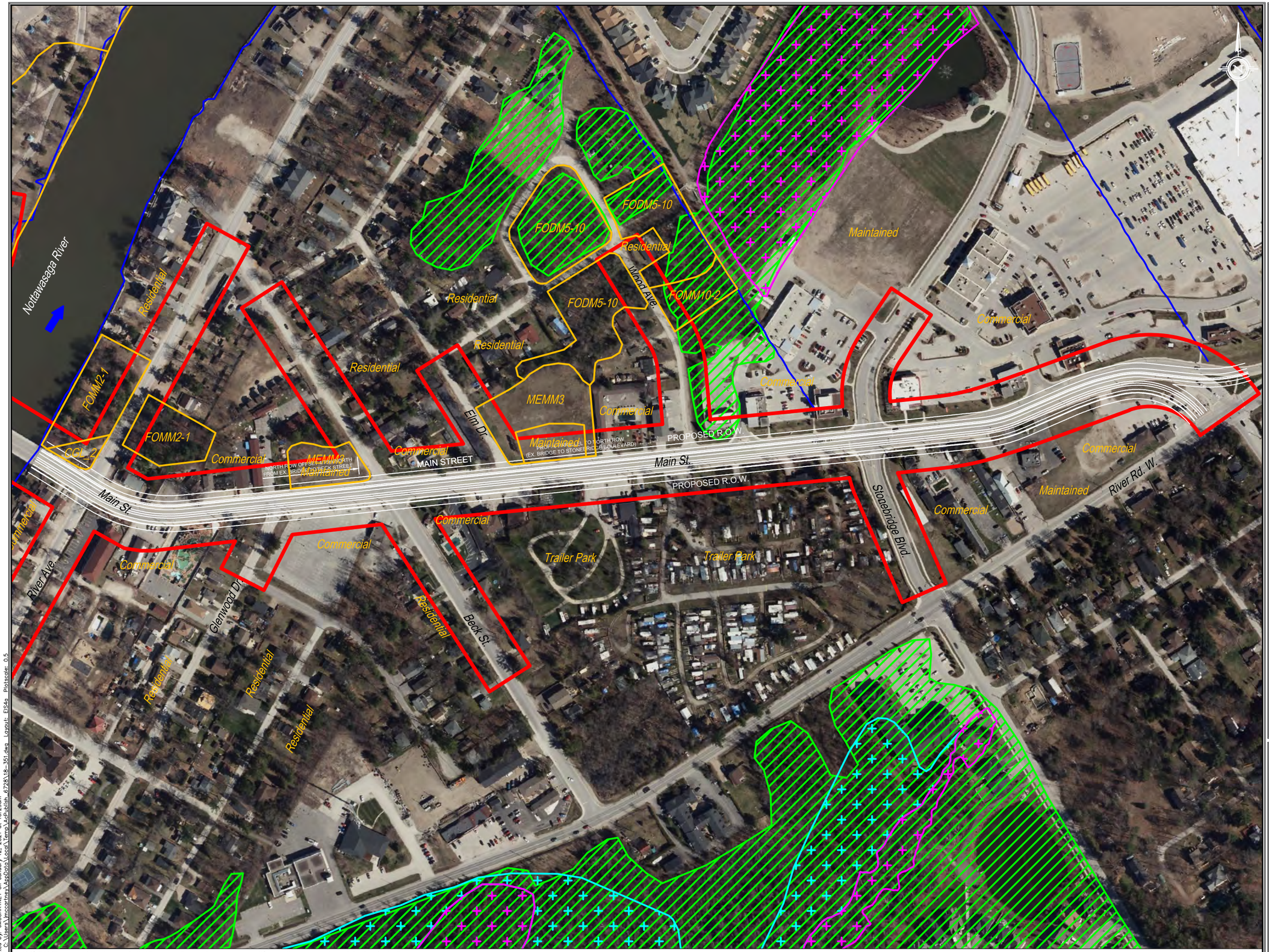

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LEGEND:

- Approx. Study Area
- Watercourse
- Flow Direction
- Provincially Significant Wetland(LIO)
- Unevaluated Wetland(LIO)
- Woodland Area(LIO)
- Preferred Design (white)
- Vegetation Communities
- CGL_2 Parkland
- FODM5-10 Dry-Fresh Sugar Maple-White Birch-Poplar Deciduous Forest Type
- FOMM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- FOMM10-2 Fresh-Moist White Spruce-Hardwood Mixed Forest Type
- MEMM3 Dry-Fresh Mixed Meadow Ecosite

50m 0 100m

HORIZONTAL SCALE 1: 3,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Preferred Design

Main Street Road Improvements, Wasaga Beach, ON

DATE ISSUED:	December 2020	Figure No.
CREATED BY:	JLM	4a
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

LEGEND:

- Approx. Study Area
- Watercourse
- Flow Direction
- 100 Year Floodline (Tatham)
- No Structure Limit (Tatham)
- Preferred Design (white)
- Vegetation Communities
- CGL_2 Parkland
- FOMM2-1 Dry-Fresh White Pine-Oak Mixed Forest Type
- SBTD1-2 Balsam Poplar Treed Sand Dune Type
- SHOM1 Mineral Open Shore Ecosite

50m 0 100m

HORIZONTAL SCALE 1: 3,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Preferred Design

Mosley St. & Beach Dr. Road Improvements, Wasaga Beach, ON

DATE ISSUED:	December 2020	Figure No.
CREATED BY:	JLM	4b
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on January 12, 2021 at 11:58am
File: P:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\04.0 - Drafting\18-351.dwg Layout: EIS4b Plotscale: 0.5

Table 1. Ecological Land Classification (ELC) Vegetation Community Descriptions, Wasaga Beach, 2020

Ecological Land Classification						Ground Cover
System	**Community Class**	**Community Series**	**Ecosite**	**Vegetation Type**	**Composition**	
TE, Terrestrial	SH, Shoreline	SHO, Open Shoreline	SHOM1, Mineral Open Shoreline Ecosite		This community is comprised of the approximately 20-30m wide band of barren sand beach between Beach Drive and the waterline of Georgian Bay. It is exposed to wave energies, wind and ice scour, regular raking during the spring/summer tourism season and heavy use by beach-goers. This has all served to keep this portion of the beach generally free from vegetation.	N/A
TE, Terrestrial	SB, Sand Barren and Dune	SBT, Treed Sand Barren and Dune	SBTD1, Treed Sand Dune Ecosite	SBTD1-2, Balsam Poplar Treed Sand Dune Type	This vegetation community on foredunes reaching several metres above lake level is dominated by open-spaced Balsam Poplar in the canopy, with a small number of Eastern Cottonwood throughout. Small clusters of trees are separated by 2-3m wide braided sand blowout paths as much as 2-3m deep between patches of stabilizing beach grasses and very few forbs.	The sparse ground layer vegetation is predominantly composed of American Beachgrass on the nearshore lakeside face of the foredune. Further from the beach, as dune elevation increases, dominant grasses include Sand Dropseed and Canada Wild Rye. Intermixed among the grasses are occasional forbs, including Beach Pea, Biennial Wormwood and Smooth Aster.
TE, Terrestrial	ME, Meadow	MEM, Mixed Meadow	MEMM3, Dry - Fresh Mixed Meadow Ecosite		Two small instances of this vegetation community occur on small lots adjacent to Main Street. Both occurrences are dominated by "weedy" shrubs, forbs and grasses and both are partially maintained (mowed) and occasionally used for day-parking. Few trees are present, with species including Black Locust and Russian Olive. Sparse shrub layer includes Red-osier Dogwood, Choke Cherry and Wild Grape.	Ground flora is an even mix of grasses and forbs and is dominated by goldenrods, Smooth Brome, Sand Dropseed, Wild Carrot, Biennial Wormwood, Annual Ragweed, Viper's-bugloss, Spotted Knapweed and Common Yarrow.
TE, Terrestrial	FO, Forest	FOM, Mixed Forest	FOMM2, Dry - Fresh White Pine - Hardwood Mixed Forest Ecosite	FOMM2-1, Dry - Fresh White Pine - Oak Mixed Forest Type	There are several occurrences of this remnant Pine-Oak forest vegetation community within the study area. All occur adjacent to the Nottawasaga River on ancient low lakeshore dunes. The canopy is dominated by tall, mature White Pine, Red Pine and Red Oak, with Staghorn Sumac, Choke Cherry and Northern Bush Honeysuckle in the shrub layer.	Ground flora is dominated by Star-flowered False Solomon's-seal, Poison Ivy, Canada Mayflower, Sarsaparilla, Smooth Aster, Black Raspberry and Bracken Fern.
Terrestrial	FO, Forest	FOM, Mixed Forest	FOMM10, Fresh - Moist Spruce / Fir - Hardwood Mixed Forest Ecosite	FOMM10-2, Fresh - Moist Spruce - Hardwood Mixed Forest Type	White Spruce and Trembling Aspen dominate the canopy, along with Paper Birch, Freeman's Maple, Green Ash, and Balsam Fir. Speckled Alder, Red-osier Dogwood and Pin Cherry are common in the shrub layer.	Ground flora is composed primarily of a mix of fresh-moist forbs such as Poison Ivy, Smooth Goldenrod, Panicled Aster, Colt's-foot, Canada Anemone and Canada Mayflower.
Terrestrial	FO, Forest	FOD, Deciduous Forest	FODM5, Dry - Fresh Sugar Maple Deciduous Forest Ecosite	FODM5-10, Dry - Fresh Sugar Maple - White Birch - Poplar Deciduous Forest Type	This mid-age woodland community is composed primarily of Sugar Maple and Trembling Aspen along with Green Ash, Paper Birch and White Cedar in the canopy and sub-canopy, Alternate-leaved Dogwood is common in the shrub layer.	Ground flora is composed mainly of small woody shrubs (Sarsaparilla, Poison Ivy), and forbs such as Calico Aster, Colt's-foot, Canada Mayflower, and Canada Anemone.

Table 1. Ecological Land Classification (ELC) Vegetation Community Descriptions, Wasaga Beach, 2020

Ecological Land Classification						Ground Cover
System	Community Class	Community Series	Ecosite	Vegetation Type	Composition	
TE, Terrestrial	CV, Constructed	CGL, Green Lands	CGL_2, Parkland		These polygons include small portions of Wasaga Beach Provincial Park captured within the study area. There are two areas of this ELC type within the study area; at east of Spruce Street and west of 3rd Street. While the areas contain remnants of natural habitats, they are maintained and utilized for outdoor recreational purposes. Both locations are sparsely treed with poplar, pine, oak.	Ground cover is generally maintained "lawn" composed predominantly of Sand Dropseed, with other grasses and forbs intermixed, particularly under tree clusters.
TE, Terrestrial	CV, Constructed		Main St., Mosely St., Side Streets		This encompasses all of the greenspace areas adjacent to Mosley Street, Main Street and associated side streets within the study area (unless already discussed above). This includes lawns and landscaped areas, boulevards, street trees and other vegetation within the study area.	Dominated by turf grasses (Kentucky Bluegrass, Annual Bluegrass), typical lawn "weeds" such as dandelion, clover, ragweed and miscellaneous native and non-native grasses and forbs.

Table 2. Vascular Plant Species List, Wasaga Beach, 2020

AEC 18-351

			Vegetation Communities[2]							Conservation Rankings[3]		
FAMILY[1]	SCIENTIFIC NAME[1]	COMMON NAME[1]	Main, Mosely & Side Sts.	FOMM10-2	FODM5-10	MEMM3	FOMM2-1	SBTD1-2	CGL_2	GRANK	SRANK	TRACK
Aceraceae	***Acer ginnala***	Amur Maple	X							GNR	SNA	N
Aceraceae	***Acer negundo***	Manitoba Maple	X				X			G5	S5	N
Aceraceae	***Acer platanoides***	Norway Maple	X							GNR	SE5	N
Aceraceae	***Acer rubrum***	Red Maple					X			G5	S5	N
Aceraceae	***Acer saccharinum***	Silver Maple			X					G5	S5	N
Aceraceae	***Acer saccharum***	Sugar Maple	X						X	G5	S5	N
Aceraceae	***Acer x freemanii***	(Acer rubrum X Acer saccharinum)		X						GNA	SNA	N
Anacardiaceae	***Rhus typhina***	Staghorn Sumac		X			X			G5	S5	N
Anacardiaceae	***Toxicodendron rydbergii***	Rydberg's Poison Ivy		X	X	X	X			G5	S5	N
Apiaceae	***Daucus carota***	Wild Carrot	X	X		X	X			GNR	SE5	N
Araliaceae	***Aralia nudicaulis***	Wild Sarsaparilla			X		X			G5	S5	N
Asclepiadaceae	***Asclepias syriaca***	Common Milkweed				X	X			G5	S5	N
Asteraceae	***Achillea millefolium***	Common Yarrow				X	X			G5	SE	N
Asteraceae	***Ambrosia artemisiifolia***	Annual Ragweed				X				G5	S5	N
Asteraceae	***Artemisia biennis***	Biennial Wormwood				X		X	X	G5	SE5	N
Asteraceae	***Centaurea stoebe***	Spotted Knapweed	X			X	X			GNR	SE5	N
Asteraceae	***Cichorium intybus***	Chicory	X	X						GNR	SE5	N
Asteraceae	***Erigeron annuus***	Annual Fleabane				X				G5	S5	N
Asteraceae	***Eurybia macrophylla***	Large-leaved Aster					X			G5	S5	N
Asteraceae	***Euthamia graminifolia***	Grass-leaved Goldenrod				X				G5	S5	N
Asteraceae	***Leucanthemum vulgare***	Oxeye Daisy				X				GNR	SE5	N
Asteraceae	***Pilosella caespitosa***	Meadow Hawkweed	X			X	X			GNR	SE5	N
Asteraceae	***Solidago canadensis var. canadensis***	Canada Goldenrod				X				G5T5	S5	N
Asteraceae	***Solidago gigantea var. gigantea***	Smooth Goldenrod		X		X				G5	S5	N
Asteraceae	***Solidago nemoralis ssp. nemoralis***	Gray-stemmed Goldenrod				X				G5T5	S5	N
Asteraceae	***Symphyotrichum laeve var. laeve***	Smooth Aster	X			X		X	X	G5T5	S5	N
Asteraceae	***Symphyotrichum lanceolatum ssp. lanceolatum***	Panicled Aster	X	X						G5T5	S5	N
Asteraceae	***Symphyotrichum lateriflorum***	Calico Aster		X	X					G5	S5	N
Asteraceae	***Symphyotrichum urophyllum***	Arrow-leaved Aster		X		X			X	G4G5	S4	N
Asteraceae	***Taraxacum officinale***	Common Dandelion	X			X				G5	SE5	N
Asteraceae	***Tussilago farfara***	Colt's-foot			X					GNR	SE5	N
Berberidaceae	***Berberis thunbergii***	Japanese Barberry	X							GNR	SE5	N
Betulaceae	***Alnus incana***	Speckled Alder		X						G5	S5	N
Betulaceae	***Betula papyrifera***	Paper Birch	X	X	X			X	X	G5	S5	N
Boraginaceae	***Echium vulgare***	Common Viper's-bugloss	X			X				GNR	SE5	N
Brassicaceae	***Lepidium campestre***	Field Peppergrass	X							GNR	SE5	N
Caprifoliaceae	***Diervilla lonicera***	Northern Bush-honeysuckle					X		X	G5	S5	N
Caprifoliaceae	***Lonicera tatarica***	Tartarian Honeysuckle							X	GNR	SE5	N
Caryophyllaceae	***Saponaria officinalis***	Bouncing-bet				X	X			GNR	SE5	N
Caryophyllaceae	***Silene vulgaris***	Maiden's Tears				X				GNR	SE5	N
Celastraceae	***Celastrus scandens***	Climbing Bittersweet				X	X			G5	S5	N
Celastraceae	***Euonymus alatus***	Winged Euonymus	X							GNR	SE2	N
Cornaceae	***Cornus alternifolia***	Alternate-leaved Dogwood		X	X		X		X	G5	S5	N
Cornaceae	***Cornus stolonifera***	Red-osier Dogwood	X	X	X	X			X	G5	S5	N
Cupressaceae	***Thuja occidentalis***	Eastern White Cedar	X		X		X		X	G5	S5	N
Cyperaceae	***Carex gracillima***	Graceful Sedge			X					G5	S5	N

FAMILY[1]	SCIENTIFIC NAME[1]	COMMON NAME[1]	Main, Mosely & Side Sts.	FOMM10-2	FODM5-10	MEMM3	FOMM2-1	SBTD1-2	CGL_2	GRANK	SRANK	TRACK
Dennstaedtiaceae	***Pteridium aquilinum***	Bracken Fern					X			G5	S5	N
Elaeagnaceae	***Elaeagnus angustifolia***	Russian Olive				X				GNR	SE3	N
Equisetaceae	***Equisetum hyemale***	Common Scouring-rush	X			X				G5	S5	N
Fabaceae	***Gleditsia triacanthos***	Honey-locust	X							G5	S2?	Y
Fabaceae	***Lathyrus japonicus***	Beach Pea						X		G5	S4	N
Fabaceae	***Lotus corniculatus***	Garden Bird's-foot Trefoil				X				GNR	SE5	N
Fabaceae	***Medicago lupulina***	Black Medic	X							GNR	SE5	N
Fabaceae	***Melilotus albus***	White Sweet-clover	X			X	X			G5	SE5	N
Fabaceae	***Robinia pseudoacacia***	Black Locust	X			X				G5	SE5	N
Fabaceae	***Trifolium pratense***	Red Clover		X		X				GNR	SE5	N
Fabaceae	***Trifolium repens***	White Clover	X							GNR	SE5	N
Fabaceae	***Vicia cracca***	Tufted Vetch						X		GNR	SE5	N
Fagaceae	***Quercus rubra***	Northern Red Oak	X	X	X		X			G5	S5	N
Fagaceae	***Quercus velutina***	Black Oak	X							G5	S4	N
Geraniaceae	***Erodium cicutarium***	Common Storksbill	X							GNR	SE3	N
Juncaceae	***Juncus balticus***	Baltic Rush				X				G5	S5	N
Juncaceae	***Juncus tenuis***	Path Rush				X				G5	S5	N
Lamiaceae	***Monarda fistulosa var. fistulosa***	Wild Bergamot	X							G5T5?	SU	N
Liliaceae	***Maianthemum canadense***	Wild Lily-of-the-valley			X					G5	S5	N
Liliaceae	***Maianthemum stellatum***	Star-flowered False Solomon's-seal	X		X	X	X		X	G5	S5	N
Lythraceae	***Lythrum salicaria***	Purple Loosestrife		X						G5	SE5	N
Moraceae	***Morus alba***	White Mulberry	X							GNR	SE5	N
Oleaceae	***Fraxinus americana***	White Ash	X	X			X			G5	S4	N
Oleaceae	***Fraxinus pennsylvanica***	Green Ash		X	X					G5	S4	N
Oleaceae	***Syringa vulgaris***	Common Lilac	X				X			GNR	SE5	N
Onagraceae	***Oenothera biennis***	Common Evening Primrose				X	X			G5	S5	N
Oxalidaceae	***Oxalis stricta***	European Wood-sorrel	X							G5	S5	N
Pinaceae	***Abies balsamea***	Balsam Fir		X						G5	S5	N
Pinaceae	***Picea abies***	Norway Spruce	X							G5	SE3	N
Pinaceae	***Picea glauca***	White Spruce	X	X						G5	S5	N
Pinaceae	***Picea pungens***	Blue Spruce	X							G5	SE1	N
Pinaceae	***Pinus banksiana***	Jack Pine	X						X	G5	S5	N
Pinaceae	***Pinus nigra***	Black Pine	X							GNR	SE3	N
Pinaceae	***Pinus resinosa***	Red Pine					X		X	G5	S5	N
Pinaceae	***Pinus strobus***	Eastern White Pine	X				X		X	G5	S5	N
Pinaceae	***Pinus sylvestris var. sylvestris***	Scots Pine	X				X		X	GNR	SE5	N
Plantaginaceae	***Plantago lanceolata***	English Plantain	X			X				G5	SE5	N
Plantaginaceae	***Plantago major***	Common Plantain	X							G5	SE5	N
Poaceae	***Agrostis gigantea***	Redtop				X				G4G5	SE5	N
Poaceae	***Agrostis scabra***	Rough Bentgrass				X				G5	S5	N
Poaceae	***Ammophila breviligulata ssp. breviligulata***	American Beachgrass						X		G5	S4	N
Poaceae	***Bromus inermis***	Awnless Brome		X		X	X			G5TNR	SE5	N
Poaceae	***Dactylis glomerata***	Orchard Grass	X			X				GNR	SE5	N
Poaceae	***Digitaria sanguinalis***	Hairy Crabgrass	X							G5	SE5	N
Poaceae	***Elymus canadensis***	Canada Wildrye						X	X	G5	S5	N
Poaceae	***Elymus repens***	Creeping Wildrye				X				GNR	SE5	N
Poaceae	***Festuca rubra ssp. rubra***	Red Fescue				X				G5T5	SE5	N
Poaceae	***Panicum capillare***	Common Panicgrass				X				G5	S5	N
Poaceae	***Panicum virgatum***	Old Switch Panicgrass				X	X			G5	S4	N

FAMILY[1]	SCIENTIFIC NAME[1]	COMMON NAME[1]	Main, Mosely & Side Sts.	FOMM10-2	FODM5-10	MEMM3	FOMM2-1	SBTD1-2	CGL_2	GRANK	SRANK	TRACK
Poaceae	***Phalaris arundinacea***	Reed Canary Grass		X						G5	S5	N
Poaceae	***Poa annua***	Annual Bluegrass	X			X			X	GNR	SE5	N
Poaceae	***Poa compressa***	Canada Bluegrass	X							GNR	SE5	N
Poaceae	***Poa pratensis ssp. pratensis***	Kentucky Bluegrass	X							G5T5	SE5	N
Poaceae	***Schizachyrium scoparium ssp. scoparium***	Little Bluestem	X							G5T5	S4	N
Poaceae	***Setaria viridis***	Green Foxtail	X				X			GNR	SE5	N
Poaceae	***Sporobolus cryptandrus***	Sand Dropseed	X			X	X	X	X	G5	S4	N
Polygonaceae	***Fallopia japonica***	Japanese Knotweed				X	X			GNR	SE5	N
Polygonaceae	***Rumex crispus***	Curly Dock				X				GNR	SE5	N
Ranunculaceae	***Anemonastrum canadensis***	Canada Anemone		X	X					G5	S5	N
Ranunculaceae	***Anemone virginiana var. virginiana***	Virginia Anemone		X						G5T5	S5?	N
Rosaceae	***Amelanchier sp.***	a Serviceberry	X							N/A	N/A	N/A
Rosaceae	***Potentilla argentea***	Silvery Cinquefoil				X				GNR	SE5	N
Rosaceae	***Potentilla recta***	Sulphur Cinquefoil				X				GNR	SE5	N
Rosaceae	***Prunus pensylvanica***	Pin Cherry		X						G5	S5	N
Rosaceae	***Prunus virginiana***	Choke Cherry			X	X	X			G5	S5	N
Rosaceae	***Rosa blanda***	Smooth Rose				X				G5	S5	N
Rosaceae	***Rosa sp.***	a Rose	X							N/A	N/A	N/A
Rosaceae	***Rubus occidentalis***	Black Raspberry					X			G5	S5	N
Salicaceae	***Populus balsamifera***	Balsam Poplar	X					X	X	G5	S5	N
Salicaceae	***Populus deltoides ssp. deltoides***	Eastern Cottonwood	X					X	X	G5T5	S5	Y
Salicaceae	***Populus tremuloides***	Trembling Aspen	X	X	X				X	G5	S5	N
Salicaceae	***Salix humilis***	Prairie Willow							X	G5	S5	N
Salicaceae	***Salix lucida***	Shining Willow		X						G5	S5	Y
Salicaceae	***Salix sp.***	a Willow							X	N/A	N/A	N/A
Salicaceae	***Salix x fragilis***	(Salix alba X Salix euxina)			X					GNR	SE4	N
Scrophulariaceae	***Verbascum thapsus***	Common Mullein				X				GNR	SE5	N
Tiliaceae	***Tilia americana***	American Basswood	X							G5	S5	N
Tiliaceae	***Tilia cordata***	Little-leaf Linden	X							GNR	SE1	N
Vitaceae	***Vitis riparia***	Riverbank Grape	X	X		X	X			G5	S5	Y

[1]Nomenclature based

[2]ELC Codes based on Ecological Land Classification for Southern Ontario manual (Lee et al., 1998)

[3]Conservation Rankings: From Ontario Ministry of Natural Resources, Natural Heritage Information Centre (http://nhic.mnr.gov.on.ca/nhic_.cfm)

G-Rank = Global scale (from 1-5); G1 - Critically Imperiled, G2 - Imperiled, G3 - Vulnerable, G4 - Apparently Secure, G5 – Secure/Common; NR – Not Ranked,
T – Infraspecific Taxon/Trinomial (e.g. subspecies)

S-rank = Sub-national/provincial scale (from 1-5); S1 - Extremely Rare, S2 - Very Rare, S3 - Rare to Uncommon, S4 - Common, S5 - Very Common; NA – Not Applicable because not a suitable conservation target; E - Exotic; H - Historic

Track = Tracked provincially; Y - Yes, N - No, N/A = Not Applicable

Table 3. Species at Risk and Species at Risk Habitat Assessment, Wasaga Beach, 2020 AEC 18-351

Commmon Name[1]	Species Name	ESA	Key Habitats Used By Species[2]	Habitat In or Adjacent to Study Area?	Reported Locally?[3]	Detected During Field Surveys?	Possible Constraint to Proposed Development?
American Badger (Southwestern Ontario population)	*Taxidea taxus jacksoni*	END	Non-forested grassland and shrubland biomes. Agricultural areas support badgers provided there is sufficient hedgerows, fencerows and field edges. Are also known from alpine areas and wetlands. Soil and prey availability are key defining habitat features (COSEWIC, 2012). ESA Protection: Species and regulated habitat protection	No	Yes	No	No
Barn Swallow	*Hirundo rustica*	THR	Ledges and walls of man-made structures such as buildings, barns, boathouses, garages, culverts and bridges. Also nest in caves, holes, crevices and cliff ledges (COSEWIC, 2011a). ESA Protection: Species and general habitat protection	Yes	Yes	No	Yes
Bank Swallow	*Riparia riparia*	THR	Nests in burrows excavated in natural and human-made settings with vertical sand and silt faces. Commonly found in sand or gravel pits, road cuts, lakeshore bluffs, and along riverbanks (COSEWIC, 2013a). ESA Protection: Species and general habitat protection	No	Yes	No	No
Blanding's Turtle	*Enydoidea blandingii*	THR	Blanding's Turtles are a primarily aquatic species that prefer wetland habitats, lakes, ponds, slow-moving streams, etc., however they may utilize upland areas to search for suitable basking and nesting sites. In general, preferred wetland sites are eutrophic and characterized by clear, shallow water, with organic substrates and high density of aquatic vegetation (COSEWIC, 2005). ESA Protection: Species and general habitat protection	No	No	No	No

Bobolink	*Dolichonyx oryzivorus*	THR	Nests primarily in forage crops (***e.g.*** hayfields and pastures) dominated by a variety of species such as clover, Timothy, Kentucky Bluegrass, tall grass, and broadleaved plants. Also occurs in wet prairie, graminoid peatlands, and abandoned fields dominated by tall grasses. Does not generally occupy fields of row crops (***e.g*** . corn, soybeans, wheat) or short-grass prairie. Sensitive to habitat size and has lower reproductive success in small habitat fragments (COSEWIC, 2010). ESA Protection: Species and general habitat protection	No	Yes	No	No
Butternut	*Juglans cinerea*	END	Commonly found in riparian habitats, but is also found in rich, moist, well-drained loams, and well-drained gravels. Butternut is intolerant of shade (COSEWIC, 2003). ESA Protection: Species and general habitat protection	Yes	Yes	No	No
Chimney Swift	*Chaetura pelagica*	THR	Nests primarily in chimneys though some populations (***i.e.*** in rural northern areas) may nest in cavity trees (COSEWIC, 2007). Recent changes in chimney design may be a significant factor in recent declines in numbers (Cadman ***et al*** ., 2007). ESA Protection: Species and general habitat protection	No	Yes	No	No
Eastern Meadowlark	*Sturnella magna*	THR	Most common in grassland, pastures, savannahs, as well as anthropogenic grassland habitats, including hayfields, weedy meadows, young orchards, golf courses, restored surface mines, ***etc*** . Occasionally nest in row crop fields such as corn and soybean, but there are considered low-quality habitat. Large tracts of grassland are preferred over smaller fragments and the minimum area required is estimated at 5ha (COSEWIC, 2011b). ESA Protection: Species and general habitat protection	No	Yes	No	No
Eastern Small-footed Myotis	*Myotis lleibii*	END	Generally occurs in mountainous or rocky regions as well as in buildings, on the face of rock bluffs, and beneath slabs of rock and stones. Hibernation is typically confined to caves and old mines (Best and Jennings, 1997). ESA Protection: Species and general habitat protection	No	No	No	No

Eastern Whip-poor-will	*Antrostomus vociferus*	THR	Semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances, are preferred nesting habitats (COSEWIC, 2009a). ESA Protection: Species and general habitat protection	No	Yes	No	No
Hill's Thistle	*Cirsium hillii*	THR	Found in a variety of open, dry, sandy, fire-prone habitats, including such communities as gravel hill or bluff prairies, sand prairies, pine barrens, oak barrens, sand dunes, oak savannah, and open woods (COSEWIC, 2004). ESA Protection: Species and general habitat protection	No	Yes	No	No
Lake Sturgeon (Great Lakes - Upper St. Lawrence River Population)	*Acipenser fulvescens*	END	Generally found in the shallow areas of lakes or larger rivers, moving into smaller rivers to spawn. Usually found at depths of 5 - 10m and are in areas where water velocity does not exceed 70cm/sec (COSEWIC, 2006). ESA Protection: Species and general habitat protection	Yes	Yes	No	Potentially, if in-water works required
Least Bittern	*Ixobrychus exilis*	THR	Breed strictly in marshes of emergents (usually cattails) that have relatively stable water levels and interspersed areas of open water (COSEWIC, 2009b). ESA Protection: Species and general habitat protection	No	Yes	No	No
Little Brown Bat	*Myotis lucifugus*	END	Forests and regularly aging human structures as maternity roost sites. Regularly associated with attics of older buildings and barns for summer maternity roost colonies. Overwintering sites are characteristically mines or caves, but can often include buildings (MNRF, 2014) COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Yes	Yes	No	Yes
Northern Long-eared Myotis	*Myotis septentrionalis*	END	Maternity roost sites are generally located within deciduous and mixed forests and focused in snags including loose bark and cavities of trees. Overwintering sites are characteristically mines or caves (COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Yes	Yes	No	Yes

Piping Plover	*Charadrius melodus*	END	Nest on sand and pebble beaches of freshwater dune formations on barrier islands, peninsulas or shorelines of large lakes (COSEWIC, 2013c). ESA Protection: Species and regulated habitat protection	Yes	Yes	No	Yes
Restricted Species		THR	Habitat features include: well-drained soil; loose or sandy soil; open vegetative cover; brushland or forest edge; proximity to water; and climatic conditions typical of the eastern deciduous forest biome. In the Georgian Bay region, open grass, sand, human-impacted and forest habitats over rock, wetland, and aquatic habitats are preferable. ESA Protection: Species and general habitat protection	Yes	Yes	No	Yes
Spotted Wintergreen	*Chimaphila maculata*	END	Requires sandy habitats in dry-mesic Oak-Pine woods (COSEWIC, 2000). ESA Protection: Species and general habitat protection	Yes	Yes	No	No
Tri-colored Bat	*Perimyotis subflavus*	END	Maternity roost sites include forests and modified landscapes (barns or human-made structures). Overwintering sites include mines and caves (COSEWIC, 2013b). ESA Protection: Species and general habitat protection	Yes	Yes	No	Yes

[1]Comprehensive list compiled based on Species at Risk in the Town of Wasaga Beach Region - MECP, July 10, 2019.

[2]Based on the SARO list habitat descriptions (https://www.ontario.ca/page/species-risk-ontario) and COSEWIC Status Reports.

[2]Habitat as outlined within the MNRF's Species at Risk in Ontario website files (https://www.ontario.ca/environment-and-energy/species-risk-ontario-list), or Species

[3]Based on following sources: Species at Risk Ontario (https://www.ontario.ca/environment-and-energy/species-risk-ontario-list); Land Information Ontario (https://www.ontario.ca/page/land-information-ontario); Make a Natural Heritage Map - Natural Heritage Information Centre (http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US); Ontario Breeding Bird Atlas (http://www.birdsontario.org/atlas/maps.jsp?lang=en); Ontario Reptile and Amphibian Atlas (https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas/), eBird (https://ebird.org/explore); Fisheries and Oceans Canada (http://www.dfo-mpo.gc.ca/species-especes/index-eng.htm); Fish Online (https://www.gisapplication.lrc.gov.on.ca/FishONLine/Index.html?site=FishONLine&viewer=FishONLine&locale=en-US); Ontario Butterfly Atlas (http://www.ontarioinsects.org/atlas_online.htm); and Atlas of the Mammals of Ontario (Dobbyn, J. 1994. Federation of Ontario Naturalists).

Best, T., and J. Jennings. 1997. Mammalian Species, *Myotis leibii* . The American Society of Mammalogists. No. 547, pp. 1-6, 5 figs.

Cadman, M., D. Sutherland, G. Beck, D. Lepage and A. Couturier. 2007. Atlas of the Breeding Birds of Ontario 2001-2005. Bird Studies Canada,

COSEWIC. 2000. COSEWIC assessment and update status report on the Spotted Wintergreen *Chimaphila maculata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 6 pp.

COSEWIC 2003. COSEWIC assessment and status report on the Butternut *Juglans cinerea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp.

COSEWIC. 2004. COSEWIC assessment and status report on Hill's Thistle *Cirsium hillii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 34 pp.

COSEWIC. 2005. COSEWIC assessment and update status report on the Blanding's Turtle *Enydoidea blandingii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.viii +40 pp.

COSEWIC. 2006. COSEWIC assessment and update status report on the Lake Sturgeon *Acipenser fulvescen* s in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 107 pp.

COSEWIC. 2007. COSEWIC assessment and update status report on the Chimney Swift *Chaetura pelagic* a in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 49 pp.

COSEWIC. 2009a. COSEWIC assessment and update status report on the Whip-poor-will *Caprimulgus vociferus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 28 pp.

COSEWIC. 2009b. COSEWIC assessment and update status report on the Least Bittern *Ixobrychus exilis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 36 pp.
COSEWIC. 2010. COSEWIC assessment and update status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 42 pp.
COSEWIC. 2011a. COSEWIC assessment and update status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp.
COSEWIC. 2011b. COSEWIC assessment and update status report on the Eastern Meadowlark *Sturnella magna* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.
COSEWIC. 2012. COSEWIC assessment and update status report on the American Badger *Taxidea taxus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. iv + 63 pp.
COSEWIC. 2013a. COSEWIC assessment and update status report on the Bank Swallow *Riparia riparia* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 48 pp.
COSEWIC. 2013b. COSEWIC assessment and update status report on the Little Brown Myotis *Myotis lucifugus* , Northern Myotis *Myotis septentrionalis* and Tri-colored Bat *Perimyotis subfalvus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.
COSEWIC. 2013c. COSEWIC assessment and update status report on the Piping Plover *circumcinctus* subspecies (*Charadrius melodus circumcinctus*) and the *melodus* subspecies (*Charadrius melodus melod*
in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 39 pp.
Ministry of Natural Resources and Forestry (MNRF). 2014. Eastern Small-footed Bat. Queen's Printer for Ontario. https://www.ontario.ca/environment-and-energy/eastern-small-footed-bat

Table 4. Summary of Road Improvement Alternatives, Natural Heritage Impacts and Sensitivity Rank, Wasaga Beach, 2020 18-351

Road Name	Road Corridor	Number of Proposed Design Alternatives	Design Alternative(s) Summary[1]	Potential Impacts to NHFFs[2]	Rank[4]
Main Street	Between River Road West and Main Street Bridge	1	**Option 1: Maintain existing road alignment and 30m ROW from River Road West to Beck Street; maintain existing alignment, but widen ROW from 20m to 30m from Beck Street to River Road East (5m on either side of road); widen existing ROW by 5m on north side of Main Street only from River Road East to Main Street Bridge to match existing ROW on south side of Main Street; minimal intersection changes at Main Street/River Road East**	Potential direct impacts to Northern Map Turtle, Snapping Turtle and Silver Lamprey related to any in-water works[3] at Main Street Bridge. Indirect impacts - mitigable Potential impacts to Barn Swallows nesting under Main Street Bridge or under eaves of old buildings - mitigable Potential impacts to SAR bats and/or ROW roosting habitat (*e.g* ., roadside snag trees, old buildings) - mitigable Potential impacts to migratory birds nesting in streetscape trees if trees to be removed - mitigable Possible direct impacts to Lake Sturgeon using Nottawasaga River, if proposed improvements near Main Street Bridge entail in-water works[3]. Indirect impacts mitigable	Low

Mosley Street	Between Spruce Street and 2nd Street	4	Option 1: Widen Mosley Street by 10m on south side only; maintain existing alignment; minimal intersection changes Option 2: Widen Mosley Street by 10m on north side only; maintain existing alignment; minimal intersection changes **Option 3: Widen by 5m on both sides of Mosley Street; maintain existing alignment; minimal intersection changes** Option 4: Realignment of Mosley Street; redesign Mosley Street/1st Street intersection; minor changes at Mosley Street/2nd Street intersection	Potential direct impacts to Northern Map Turtle, Snapping Turtle and Silver Lamprey related to any in-water works[3] at Main Street Bridge. Indirect impacts - mitigable Potential impacts to Barn Swallows nesting under Main Street Bridge or under eaves of old buildings - mitigable Potential impacts to SAR bats and/or ROW roosting habitat (e.g., roadside snag trees, old buildings) - mitigable Potential impacts to migratory birds nesting in streetscape trees if trees to be removed - mitigable	Low
Mosley Street	Between 2nd Street and 6th Street	1	**Maintain existing road alignment, but widen ROW from 20m to 23m (1.5m on either side); minimal intersection changes**	Potential impacts to Barn Swallows nesting under eaves of old buildings - mitigable Potential impacts to SAR bats and/or ROW roosting habitat (e.g., roadside snag trees, old buildings) - mitigable Potential impacts to migratory birds nesting in streetscape trees if trees to be removed - mitigable	Low

Beach Drive	Between 3rd Street and Spruce Street	4	Option 1: No change **Option 2: Maintain existing road alignment and ROW, but shift road 7.5m southeast to move road ROW away from the beach, outside Ontario Parks boundary and partially outside 100-year Flood Line[5]** Option 3: Maintain existing road alignment and ROW, but shift road 22m southeast to move road outside 100-year Flood Line[5] Option 4: Minor change to existing road alignment, maintain existing ROW, but shift road 44m southeast to move road further outside 100-year Flood Line[5]	No direct impact to shorebird migratory stopover area (SHOM1). Indirect impacts to SHOM1 - mitigable No direct impacts to Balsam Poplar Treed Sand Dune (SBTD1-2) anticipated. Indirect impacts - mitigable Potential impacts to nesting migratory birds associated with any tree removals/limbing - mitigable. This impact would be anticipated to increase progressively in scale under option #3 or #4 due to additional tree removals/limbing, but still mitigable No direct impacts anticipated to Piping Plover habitat, providing mitigation measures are followed. Possible indirect impacts - mitigable	Low (low-medium under option #3 or #4)

[1]Preferred design alternative in bold font.

[2]Natural Heritage Features and Functions (NHFFs) impact assessment summary applies to each alternative per road corridor, unless otherwise indicated.

[3]No in-water works in Nottawasaga River assumed.

[4]Sensitivity ranking applies to all alternatives per road corridor, unless otherwise indicated.

[5]Natural Hazard Study considered potential for impacts of development on Beach Drive in relation to 100-year Flood Line and Flood Hazard Limit (Shoreplan, 2020) - considered mitigable by Shoreplan (2020) (see Sections 6.0 and 7.6 in main text)

APPENDICES

Appendix A: County OP Schedules
Appendix B: Town OP Schedules
Appendix C: Background Mapping
Appendix D: Terms of Reference
Appendix E: Study Area Photographs
Appendix F: MECP SAR Information Request and Reply
Appendix G: Alternative Design Options

APPENDIX A

County OP Schedules

SCHEDULE 5.1

To the County of Simcoe Official Plan

LAND USE DESIGNATIONS

COUNTY OF SIMCOE — For the Greater Good

Designations

- Settlements
- Greenlands
- Agricultural
- Rural
- Strategic Settlement Employment Areas and Economic Employment Districts
- Lands not subject to this plan
- Settlement Area Boundary Under Appeal
- Portion of Settlement Boundary Area Under Appeal
- (1) General Location of Site-Specific Appeals
- Lands Subject to Non-Decision

Reference Data

- Settlement Area Boundary
- Built Boundaries
- Special Development Area: Big Bay Point
- Greenbelt Plan - Protected Countryside (Refer to Schedule 5.3.3 For Details)
- Niagara Escarpment Plan Area (Refer to Schedule 5.3.1 For Details)
- Oak Ridges Moraine Conservation Plan Area (Refer to Schedule 5.3.2 For Details)
- Provincial Highway
- County Road
- Trans Canada Pipeline
- Lake Simcoe Protection Plan - Watershed Boundary

** Greenbelt Plan – Protected Countryside, Oak Ridges Moraine Conservation Plan Area and Niagara Escarpment Plan Area are included within the Greenbelt Plan Area*

This schedule must be referred to in conjunction with the text of the County of Simcoe Official Plan. - Revised November 25, 2008

Approved by OMB Order dated December 29, 2016

Printed: 2017/01/03

For land use designations refer to South of Division Road Secondary Plan in the Township of Severn Official Plan and refer to Section 3.7.13 of this Plan

Refer to Schedule 5.1a and Section 3.14 Special Development Area: Big Bay Point

Information outside Simcoe County is shown on this schedule for illustrative purposes to display inter-regional linkages

N W E S

1:250,000

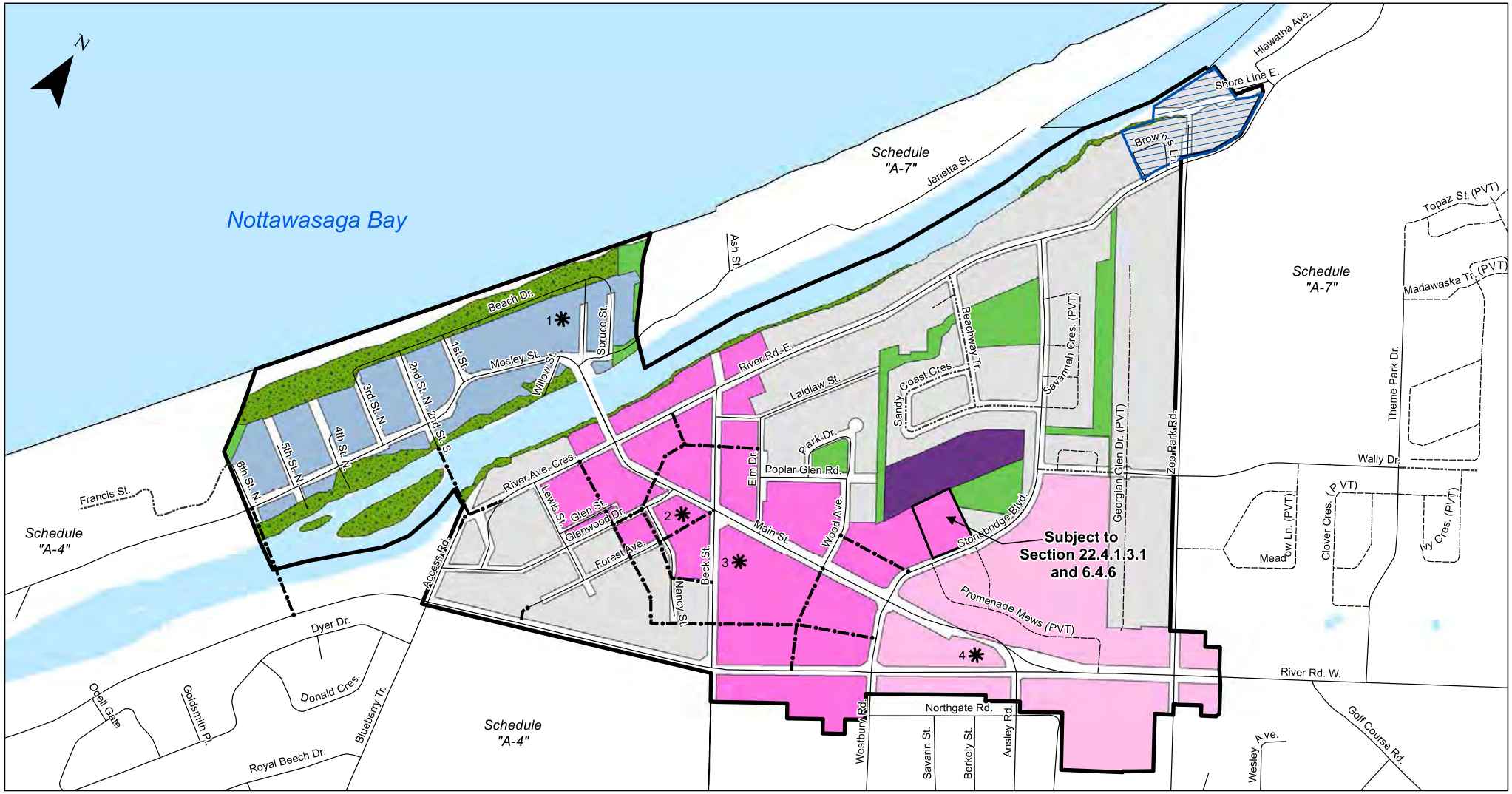
0 5 10 Km

GEOGRAPHICAL INFORMATION SYSTEMS

Georgian Bay
BEAUSOLEIL FIRST NATION
North Bay
South Bay
Gloucester Pool
MUSKOKA DISTRICT
Severn Falls
Port Severn
Little Lake
SEVERN
Sparrow Lake
Severn Sound
PENETANGUISHENE
Penetanguishene
Penetang Harbour
Port McNicoll
Victoria Harbour
Hogg Bay
Midland Bay
Midland
Sturgeon Bay
Waubaushene
Matchedash Bay
Hessel
North River
Severn River
Washago
Lake St George
West Shore
Cooper's Falls
CITY OF KAWARTHA LAKES
RAMARA
Lake Dalrymple
Sebright
Dalrymple Lake
Lake Couchiching
CHIPPEWAS OF RAMA FIRST NATION
Udney
Orillia
Ardtrea
Coldwater
TAY
TINY
Perkinsfield
Wyebridge
Wyevale
Waverley
Moonstone
Warminster
Marchmont/ Bass Lake
Prices Corners
Bass Lake
Jarratt
Orr Lake
Nottawasaga Bay
Elmvale
Hillsdale
Craighurst
Sugarbush
Rugby
Forest Hom
Atherley-Uptergrove
Lagoon City
Brechin
Gamebridge
DURHAM REGION
East Oro
Horseshoe Valley
Edgar
Hawkestone
ORO-MEDONTE
Oro Station
Guthrie
Midhurst
Shanty Bay
Lake Simcoe
Kempenfelt Bay
BARRIE
Stroud
Alcona
Leroy/ Belle Ewart
Churchill
Gilford
INNISFIL
Cookstown
BRADFORD WEST GWILLIMBURY
Bradford
Bond Head
Newton Robinson
NEW TECUMSETH
ESSA
ADJALA-TOSORONTIO
Alliston
Beeton
Tottenham
Loretto
Hockley
Colgan
Everett
Boyne River
Rosemont
Nottawasaga River
Mad River
Dunedin
CFB BORDEN
Lisle
Baxter
Angus
Ivy
Thornton
Utopia
Colwell
Centre Vespra
Snow Valley
Old Sunnidale
New Lowell
Brentwood
Glen Huron
Singhampton
Creemore
Avening
Glencairn
CLEARVIEW
Dugtroon
Stayner
Sunnidale Corners
Minesing
Anten Mills
Midhurst
Wasaga Beach
Marl Lake
Wasaga Beach
Nottawa
Batteaux
Collingwood
COLLINGWOOD
WASAGA BEACH
SPRINGWATER
Phelpston
Hillsdale
Elmvale
GREY COUNTY
DUFFERIN COUNTY
YORK REGION
PEEL REGION

APPENDIX B

Town OP Schedules



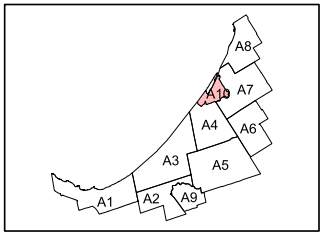
Adopted by Council: September 9, 2003

Approved by the County of Simcoe: June 22, 2004

Consolidated: January 2020

NOTE: The lot lines depicted on this map are for reference only and may not accurately reflect property boundaries in all instances.

0 175 350 700 Meters



- Special Policy Area (See Section: 22.5.1)
- Future Road Linkages
- Future Study Area (See Section: 22.5.2)
- The Beach
- Downtown Core
- Downtown Gateway
- Neighbourhood
- Open Space
- Natural Hazards
- Natural Heritage System Category 1

SCHEDULE 'A-10'
Land Use Plan

Official Plan of the Town of Wasaga Beach

APPENDIX C

Background Mapping

NVCA - Regulated Lands Map

0 0.125 0.25 0.5 km

1:9,028

October 25, 2019

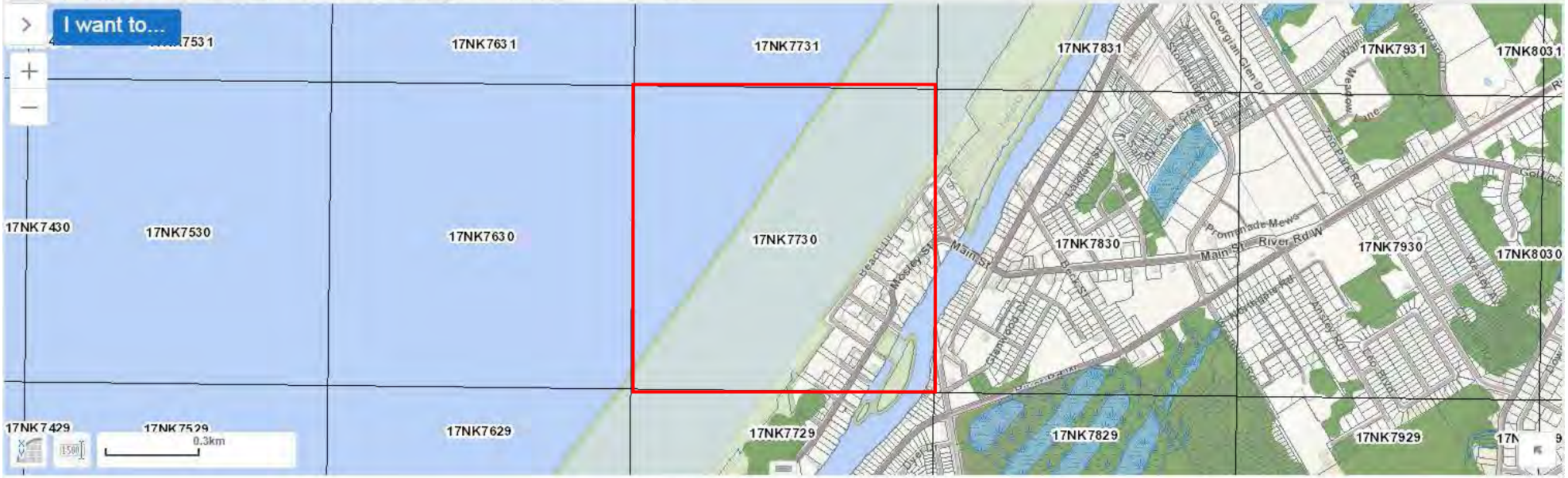
[Français]

Ontario **Ministry of Natural Resources and Forestry**
Make A Map: Natural Heritage Areas

Looking for a Park, Reserve or Wetland? Enter the name

About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978504

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
SPECIES	Piping Plover	Charadrius melodus	S1B	END	END	2009-07-20	332	http://nhic.mnr.gov.on.ca/re
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-16	4919	
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

Ontario **Ministry of Natural Resources and Forestry**
Make A Map: Natural Heritage Areas

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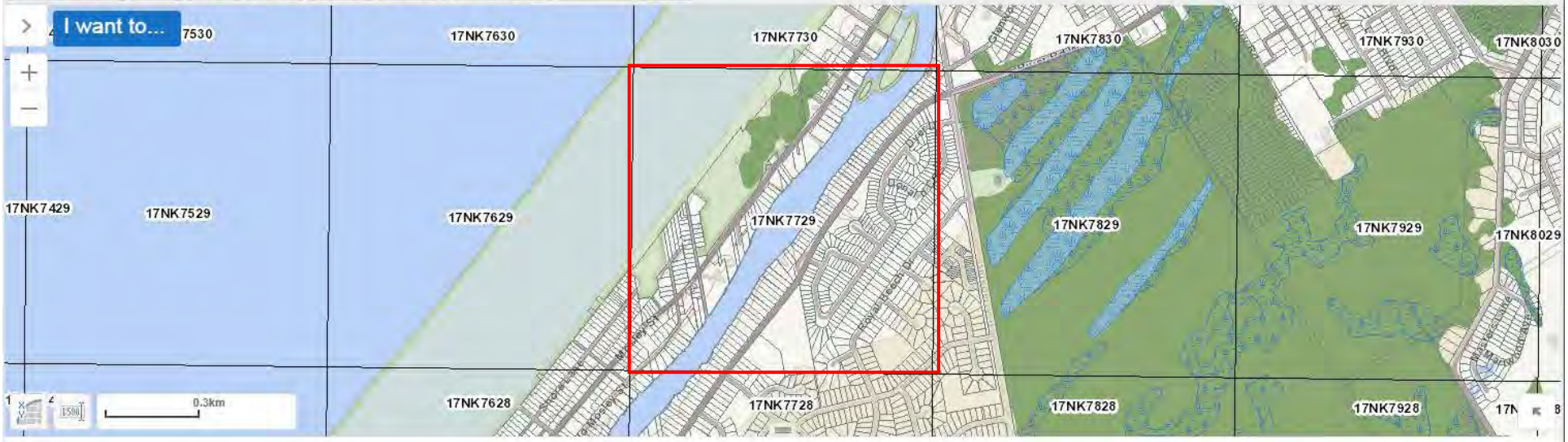
About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978413

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Prairie Warbler	Setophaga discolor	S3B	NAR	NAR	1927-06-09	21550	http://nhic.mnr.gov.on.ca/re
SPECIES	Woodland Pinedrops	Pterospora andromedea	S2			1948-07-28	33969	http://nhic.mnr.gov.on.ca/re
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

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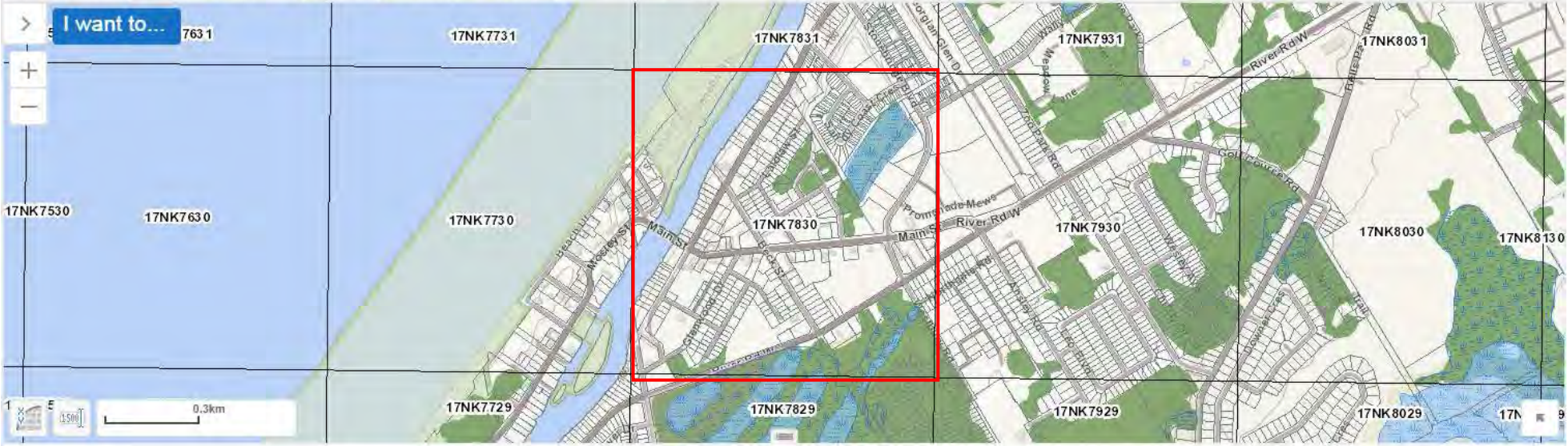
About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978514

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
SPECIES	Piping Plover	Charadrius melodus	S1B	END	END	2009-07-20	332	http://nhic.mnr.gov.on.ca/re
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-10-12	95737	http://nhic.mnr.gov.on.ca/re
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

Ontario **Ministry of Natural Resources and Forestry**
Make A Map: Natural Heritage Areas

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About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help

NHIC Data – Grid ID = 978423

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Spotted Wintergreen	Chimaphila maculata	S2	END	THR	1995-00-00	5506	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Woodland Pinedrops	Pterospora andromedea	S2			1948-07-28	33969	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-10-12	95737	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Rusty-patched Bumble Bee	Bombus affinis	S1	END	END	1941-08-21	116071	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid

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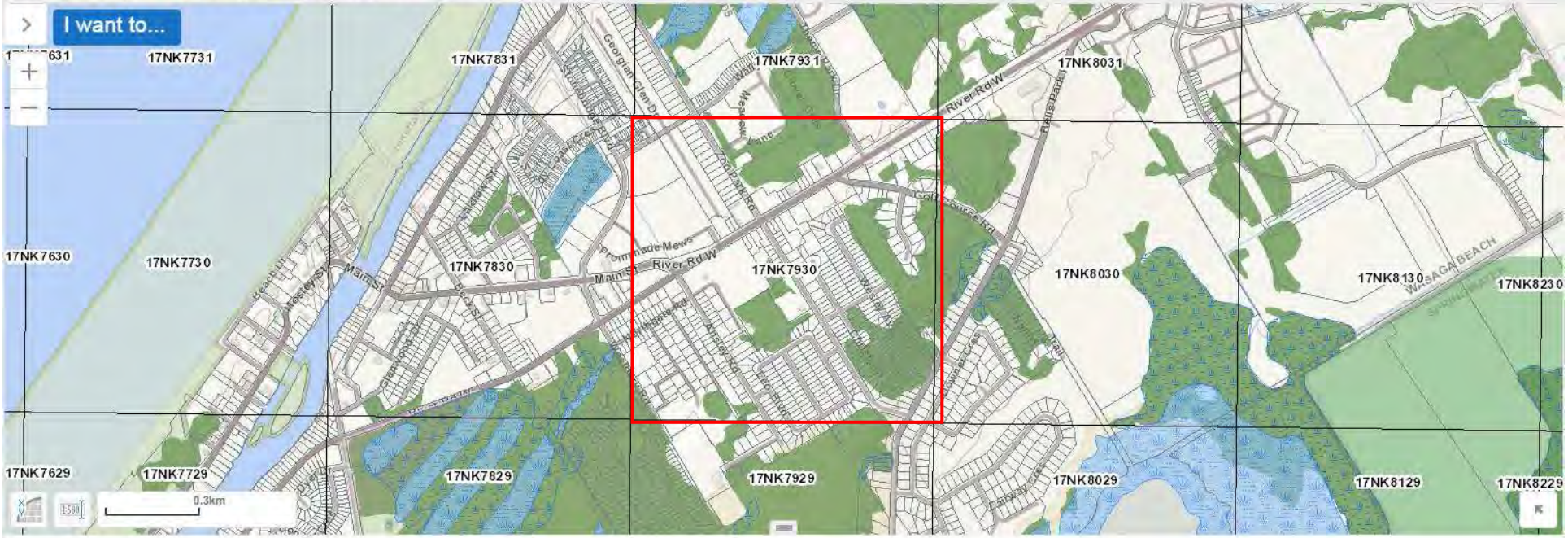
Ontario **Ministry of Natural Resources and Forestry**
Make A Map: Natural Heritage Areas

Looking for a Park, Reserve or Wetland? Enter the name

About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978524

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	

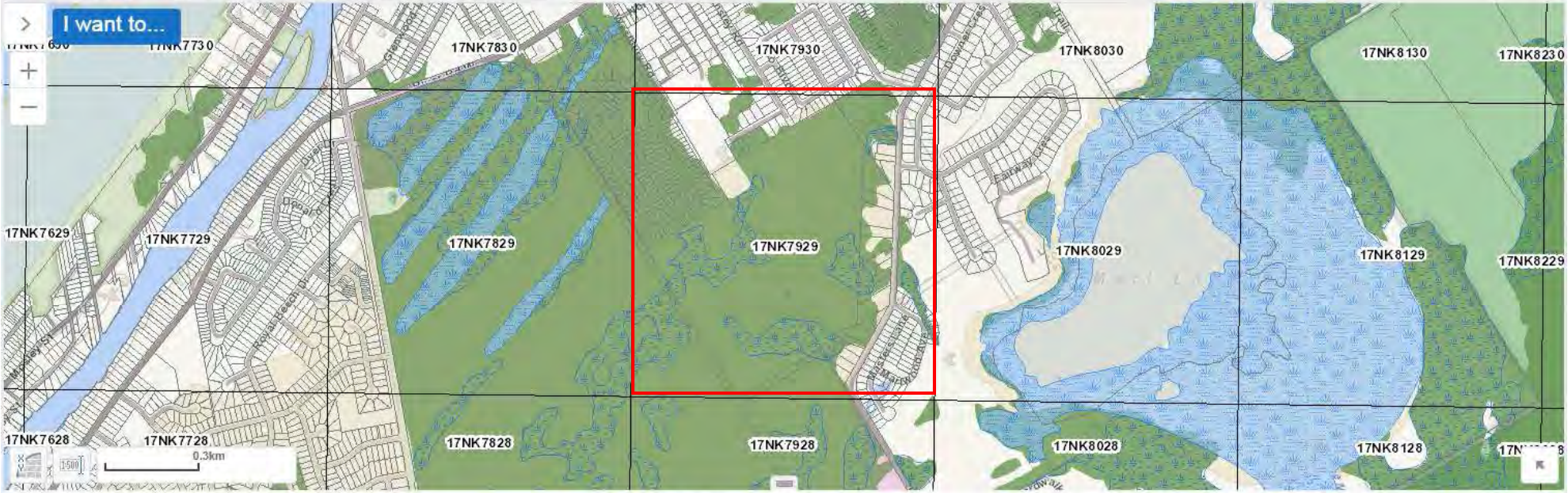
[Français]

Ontario **Ministry of Natural Resources and Forestry**
Make A Map: Natural Heritage Areas

Looking for a Park, Reserve or Wetland? Enter the name

About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978433

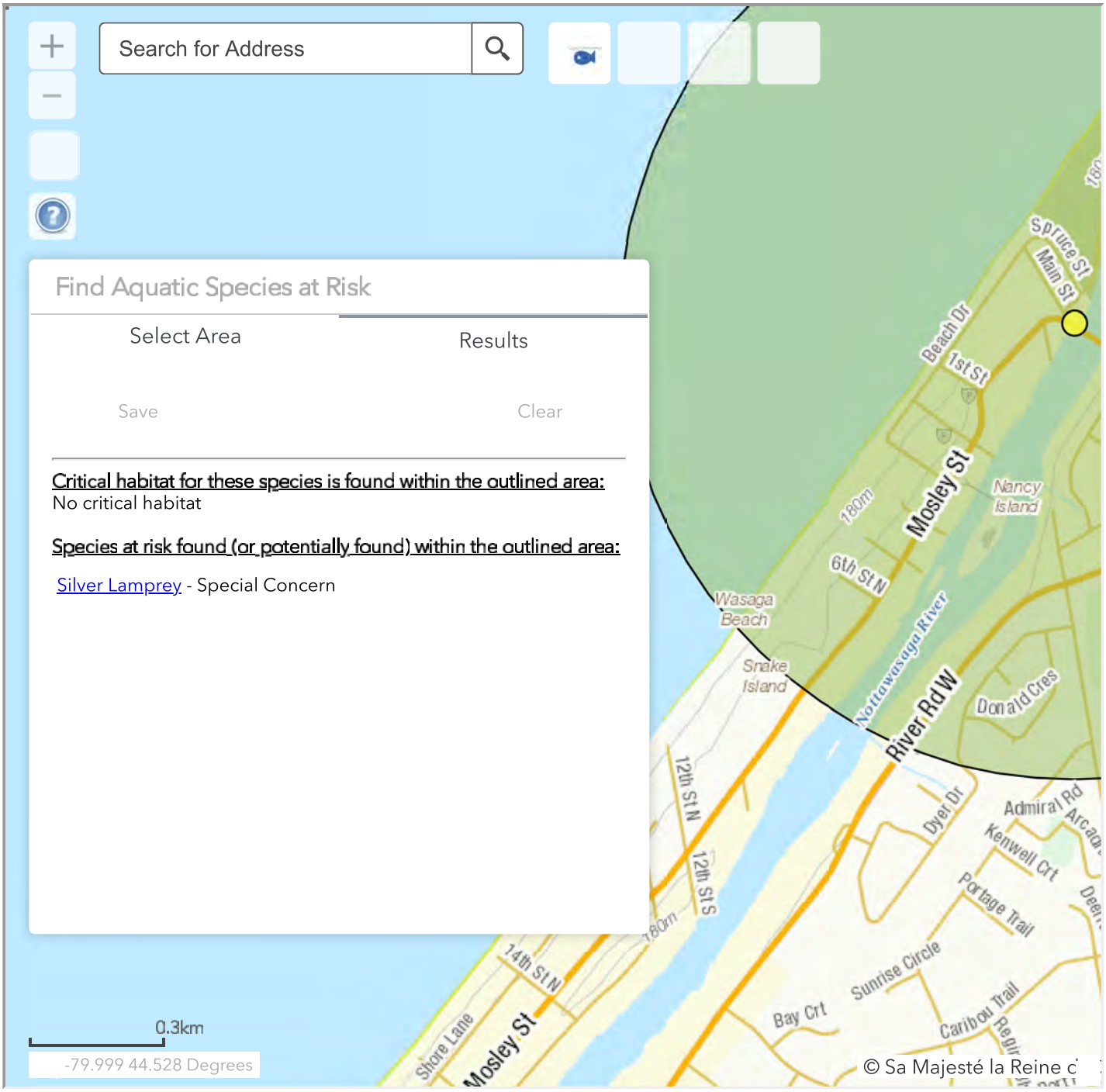
Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Spotted Wintergreen	Chimaphila maculata	S2	END	THR	1995-00-00	5506	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgriddetail&

Aquatic species at risk map

We've compiled critical habitat and distribution data for aquatic species listed under the Species at Risk Act (SARA). This map is intended to provide an overview of the distribution of aquatic species at risk and the presence of their critical habitat within Canadian waters. The official source of information is the Species at Risk Public Registry.

If you encounter an aquatic species at risk in an area that isn't currently mapped, please notify your regional Fisheries Protection Program office to ensure that you're compliant with SARA.

▶ **Information and legend**



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Date modified:
2019-08-23

Ministry of Natural Resources and Forestry
Fish ON-Line

français

Purchase a Licence

Create Stocking List

Search By

Information

Return to search results

Nottawasaga River

Waterbody | Regulations | Fish | Stocking | Survey

Fisheries Management Zone:	16
Municipality:	Town of Wasaga Beach
Geographic Township:	Sunnidale
MNRF District:	Midhurst

Additional Information

Zone 16 Fishing Regulations

Ontario Fishing Regulations Summary (Chinese)

Licence Information

Government Offices

Fisheries Management Zone 16

Guide to Eating Ontario Fish

Local Weather Forecasts

Wasaga Beach Provincial Park

Get Directions
To Here

Waterbody ID
17-5795-49314

Coordinates
44.510° N, 80.029° W
44° 30' 36.48" N, 80° 1' 45.18" W

Print Map

Map Options

Tweets by @FishWildlifeON

Ontario Fish and Wildlife
@FishWildlifeON

How fast might chronic wasting disease

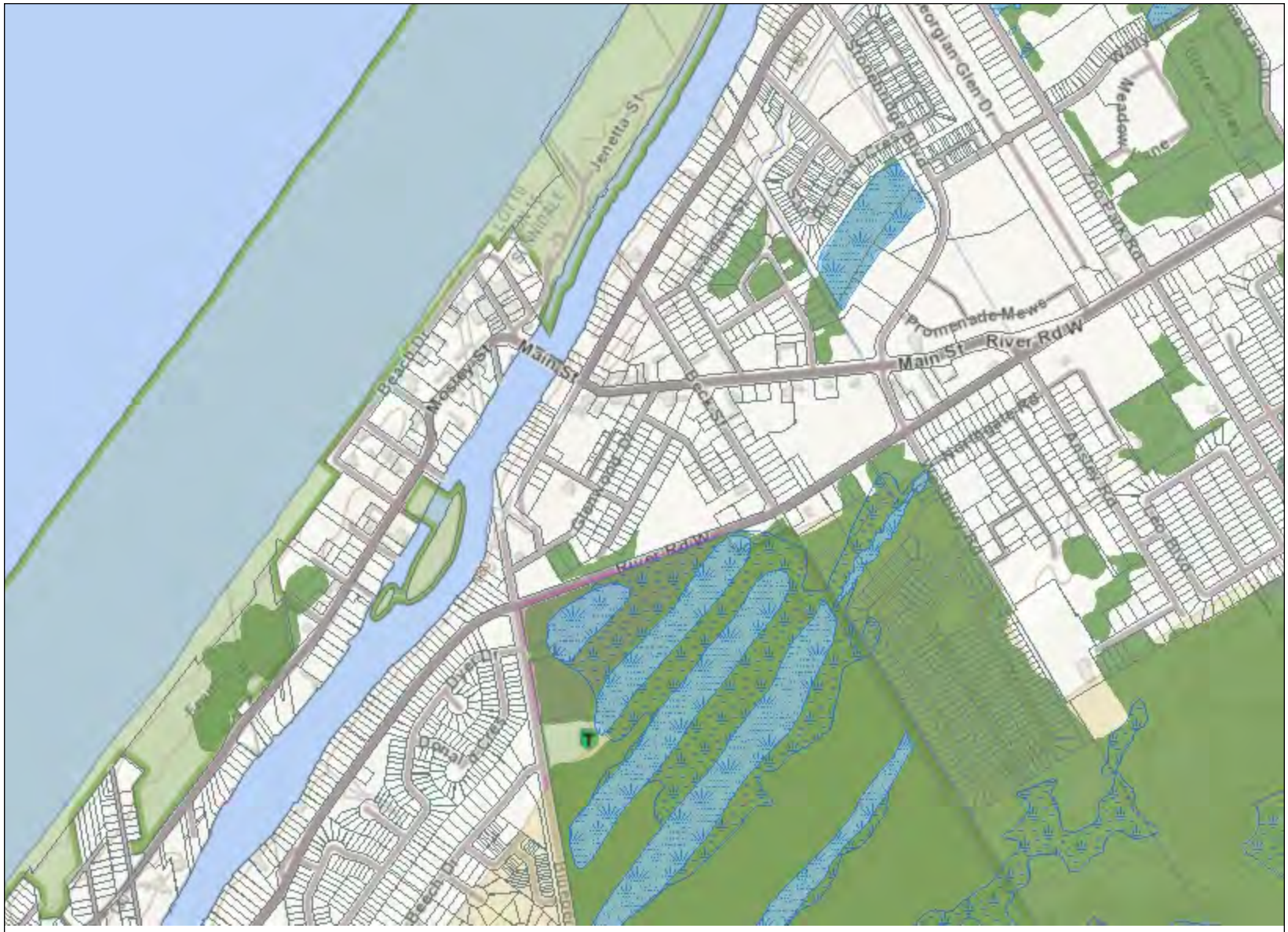
Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

MNRF- NHIC Mapping

Notes: Enter map notes



Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion

Wetland
- Provincially Significant Wetland Evaluated
- Non - Provincially Significant Wetland Evaluated
- Unevaluated Wetland

Area of Natural Heritage & Scientific Interest (ANSI)
- Provincially Significant Life Science ANSI
- Provincially Significant Earth Science ANSI

Greenbelt Plan
- Boundary
- River Valley Connections

Land Use Designations
- Protected Countryside
- Towns and Villages
- Hamlets
- Urban River Valley
- Specialty Crop Area

Niagara Escarpment Plan (NEP)
- Boundary
- Parks and Open Space System

Land Use Designations
- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area
- Urban Area
- Minor Urban Centre

Oak Ridges Moraine Conservation Plan (ORM)
- Boundary

Land Use Designations
- Natural Core Area
- Natural Linkage Area
- Countryside Area
- Rural Settlement
- Palgrave Estates Residential Community
- Settlement Area

0.7 0 0.33 0.7 Kilometers

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry(OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

APPENDIX D

Terms of Reference

From: Mike Francis [mfrancis@nvca.on.ca]
Sent: Wednesday, October 23, 2019 8:42 AM
To: Jason Runtas
Cc: Lee Bull
Subject: RE: 18-351 Terms of Reference Confirmation - Main Street - Town of Wasaga Beach

Hi Jason:

Thanks for your email and for circulating NVCA on the proposed study scope.

I have no objections to the scope listed below. If the study limits encompass any naturally-occurring vegetation communities, I recommend that your ELC exercise be conducted 'in season' and by someone with knowledge and expertise in identification of locally-relevant rare vascular plants.

Feel free to call with any additional questions.

Mike Francis, H.B.Sc., M.E.S., E.P. | Planning Ecologist

Nottawasaga Valley Conservation Authority
8195 8th Line, Utopia, ON L0M 1T0
T 705-424-1479 ext. 236 | **F** 705-424-2115
mfrancis@nvca.on.ca | **nvca.on.ca**

From: Jason Runtas [mailto:jruntas@azimuthenvironmental.com]
Sent: Friday, October 18, 2019 4:07 PM
To: Mike Francis <mfrancis@nvca.on.ca>
Subject: 18-351 Terms of Reference Confirmation - Main Street - Town of Wasaga Beach

Hi Mike,

Azimuth Environmental Consulting, Inc. has been retained as a sub consultant to the project team to complete the natural heritage evaluation concerning a Municipal Class Environmental Assessment (EA) Study, Schedule 'C' for the revitalization of Main Street from River Road West to Mosley Street as well as Mosley Street from Main Street to 6th Street and Beach Drive in the Town of Wasaga Beach. We are contacting you/the NVCA to establish a Terms of Reference for works to define existing conditions for the natural heritage evaluation. Attached please find a Figure showing the general study area (outlined in red).

Azimuth is proposing to undertake the following activities to fulfill objectives of this study:

- Obtain background information and mapping related to natural heritage features and functions for the study area through a combination of on-line searches of Simcoe County, Land Information Ontario, MNRF's NHIC database, etc. and information request submissions to the MNRF (natural heritage features and functions data), and MECP (SAR information); Note: we assume that project engineers will be contacting the NVCA with respect to natural hazards.
- Classify vegetation communities of the study area using the methods of the Ecological Land Classification System for southern Ontario to the extent possible given the urban nature of the are based on data collected in autumn 2019;
- Compile a list of wildlife encountered;
- Complete SAR assessment;
- Complete an aquatic habitat assessment to document site conditions at the Main St. bridge crossing

Please advise if the above noted activities are deemed sufficient to define existing conditions for the natural heritage evaluation component of the EA from NVCA's perspective. If not, please modify the list as required.

Best regards,

Jason Runtas H.B.Sc.

Ecologist

Azimuth Environmental Consulting, Inc.

642 Welham Road, Barrie, ON, L4N 9A1
ph: (705) 721-8451 ext 228
cell: (705) 795-8451
jason@azimuthenvironmental.com
www.azimuthenvironmental.com

Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering

APPENDIX E

Study Area Photographs

Photograph 1. Main Street and adjacent property occupied by partially-mowed meadow (MEMM3) and temporary parking spaces. Looking west. (October 29, 2019).

Photograph 2. Main Street and adjacent commercial (stores and campground) and residential properties. Looking east. (October 29, 2019).

Photograph 3. Mosley Street and adjacent wooded residential and cottage lots (FOMM2-1). Looking north-east from Wasaga Beach Community Presbyterian Church (October 29, 2019).

Photograph 4. Mosley Street and adjacent sparsely-wooded commercial cottage court and motel properties. Looking north-east from 4th Street parking lot towards commercial district (October 29, 2019).

Photograph 5. Beach Drive with adjacent commercial properties and beach community (SHOM1**),** looking south-west (September 12, 2016 – taken as part of a different project but conditions comparable).

Photograph 6. Beach Drive and adjacent beach community (SHOM1**),** looking north-east (September 12, 2016 – taken as part of a different project but conditions comparable).

APPENDIX F

MECP SAR Information Request and Reply

Information Request

Date: October 21st, 2019 **Project Reference:** AEC 18-351

Azimuth Contact: Jason Runtas, Ecologist
jruntas@azimuthenvironmental.com
(705) 721-8451 ext. 228

Attachments:
Figure 1 – Property Location
Figure 2 – Environmental Features
Figure 3 – Study Area

Project Location: Main Street in the Town of Wasaga Beach, from River Road West to Mosley Street, as well as Mosley Street from Main Street to 6th Street and Beach Drive (See Figure 2). UTM coordinates: 17 T 578094 E, 4930469 N

Activity Description: The proponent wishes to make improvements to the roads identified above in their current ROWs.

The following sources were queries for natural heritage information related to the general location of the property:

- Species at Risk Ontario (*i.e.* Ontario Regulation 230/08);
- Land Information Ontario;
- Natural Heritage Information Centre (Squares 17NK7729, 17NK7730, 17NK7830, 17NK7829, 17NK7930, 17NK7929);
- Ontario Breeding Bird Atlas (Square 17NK72, 17NK73);
- Ontario Reptile and Amphibian Atlas (Square 17NK72, 17NK73);
- Fisheries and Oceans Canada Aquatic SAR Map; and,
- Fish ON-Line.

Natural Heritage Features on and Adjacent to the Property:

- Unevaluated wetland adjacent to Stonebridge Boulevard (Figure 2);
- Woodlands adjacent to Wood Avenue; additional forested areas throughout adjacent lands (Figure 2); and,
- Nottawasaga River (Figure 2)

Consolidated SAR List for the Property and Adjacent Lands:

- Birds: Barn Swallow (THR), Bank Swallow (THR), Black Tern (SC), Bobolink (THR), Canada Warbler (SC) Chimney Swift (THR), Common Nighthawk (SC), Eastern Meadowlark (THR), Eastern Wood-Pewee (SC), Golden-winged Warbler (SC), Grasshopper Sparrow (SC), Least Bittern (THR), Olive-sided Flycatcher (SC), Piping Plover (END), Red-headed Woodpecker (SC), Short-eared Owl (SC), Whip-poor-will (THR), Wood Thrush (SC);
- Insects: Monarch Butterfly (SC);
- Mammals: Little Brown Myotis (END), Northern Myotis (END), Eastern Small-footed Bat (END) and Tri-colored Bat (END); American Badger (END)
- Plants: Butternut (END); Hill's Thistle (THR); Spotted Wintergreen (END)
- Fish: Lake Sturgeon (END), Silver Lamprey (SC)
- Reptiles: Northern Map Turtle (SC), Eastern Musk Turtle (SC), Snapping Turtle (SC), Blanding's Turtle (THR) and Eastern Hog-nosed Snake (THR); and,
- **RESTRICTED SPECIES.**

Information Request

The consolidated SAR list identifies the species we intend to include in our SAR assessment. Please advise if the MECP has records suggesting additional species that should be considered. Please identity the RESTRICTED SPECIES. Azimuth will protect the identity of the species in reporting that would become part of the public record.

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

LEGEND:

Approx. Property Boundary

REG MAP

250m 0 750m

HORIZONTAL SCALE 1: 25,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Study Area Location

Main Street Reconstruction,
Wasaga Beach, ON

DATE ISSUED: *October 2019*	Figure No.
CREATED BY: *JLM*	
PROJECT NO.: *18-351*	1
REFERENCE: *MNRF*	

LEGEND:

- Approx. Property Boundary
- Watercourse
- Flow Direction
- Provincially Significant Wetland
- Unevaluated Wetland
- Woodland Area

25m 0 75m

HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction, Wasaga Beach, ON

DATE ISSUED:	October 2019	Figure No.
CREATED BY:	JLM	2a
PROJECT NO.:	18-351	
REFERENCE:	Simcoe County Maps	

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on October 18, 2019 at 9:24am
File: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg Layout: EIS2a Plotscale: 0.5

LEGEND:

- *Approx. Property Boundary*
- *Watercourse*
- *Flow Direction*
- *Provincially Significant Wetland*
- *Unevaluated Wetland*
- *Woodland Area*

25m 0 75m

HORIZONTAL SCALE 1:2,500

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction, Wasaga Beach, ON

DATE ISSUED:	*October 2019*	Figure No. 2b
CREATED BY:	*JLM*	
PROJECT NO.:	*18-351*	
REFERENCE:	*Simcoe County Maps*	

Plotted by: JMCCARTNEY on October 18, 2019 at 9:24am
File: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg Layout: FIG2b Plotscale: 0.5

DAYSTAMP: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg

Plotted by: JMCCARTNEY on October 18, 2019 at 9:38am
File: M:\18 Projects\18-351 Main Street Reconstruction Class EA Wasaga Beach\Drafting\18-351.dwg Layout: EIS2c Plotscale: 0.5

LEGEND:

- *Approx. Property Boundary*
- *Watercourse*
- *Flow Direction*
- *Provincially Significant Wetland*
- *Unevaluated Wetland*
- *Woodland Area*

25m 0 75m

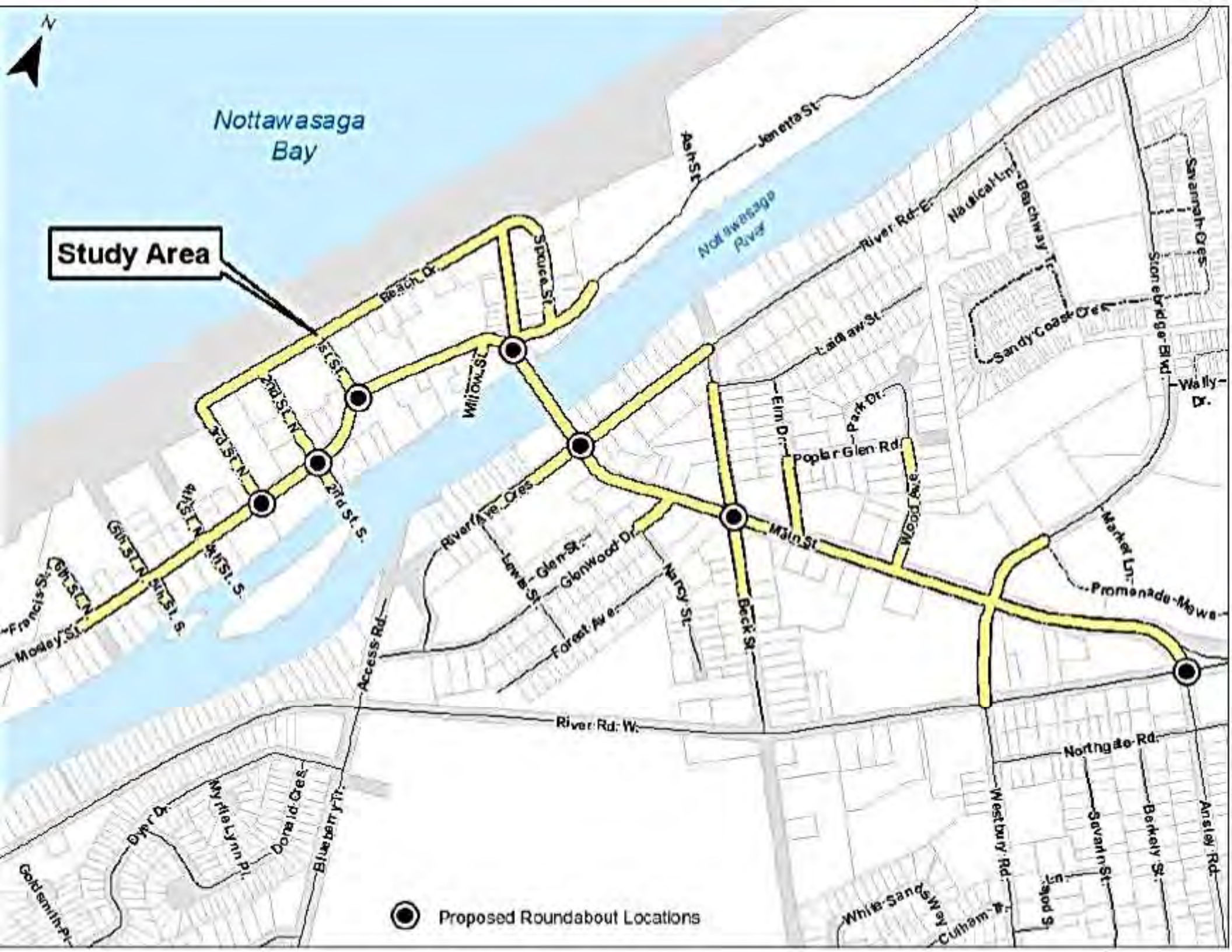
HORIZONTAL SCALE 1:2,500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Features

Main Street Reconstruction, Wasaga Beach, ON

DATE ISSUED:	*October 2019*	Figure No. 2c
CREATED BY:	*JLM*	
PROJECT NO.:	*18-351*	
REFERENCE:	*Simcoe County Maps*	


N
Nottawasaga Bay
Study Area
Nottawasaga River
Ash St
Jeneta St
River Rd E
Nautical Ln
Beachway Tr
Savannah Cres
Stonebridge Blvd
Sandy Coast Cres
Wally Dr
Laidlaw St
Elm Dr
Park Dr
Poplar Glen Rd
Wood Ave
Main St
Market Ln
Promenade Mews
Beach Dr
Spruce St
1st St S
2nd St S
3rd St S
4th St S
5th St S
6th St S
7th St S
Willow St
Francis St
Morley St
River Ave Cres
Lewis St
Glen St
Glenwood Dr
Forest Ave
Nancy St
Beck St
Access Rd
River Rd W
Northgate Rd
Westbury Rd
Savarin St
Berkely St
Ansley Rd
Dyer Dr
Myrtle Lynn Pl
Donald Cres
Blueberry Tr
Goldsmith Pl
White Sands Way
Cuthem Pl
Proposed Roundabout Locations

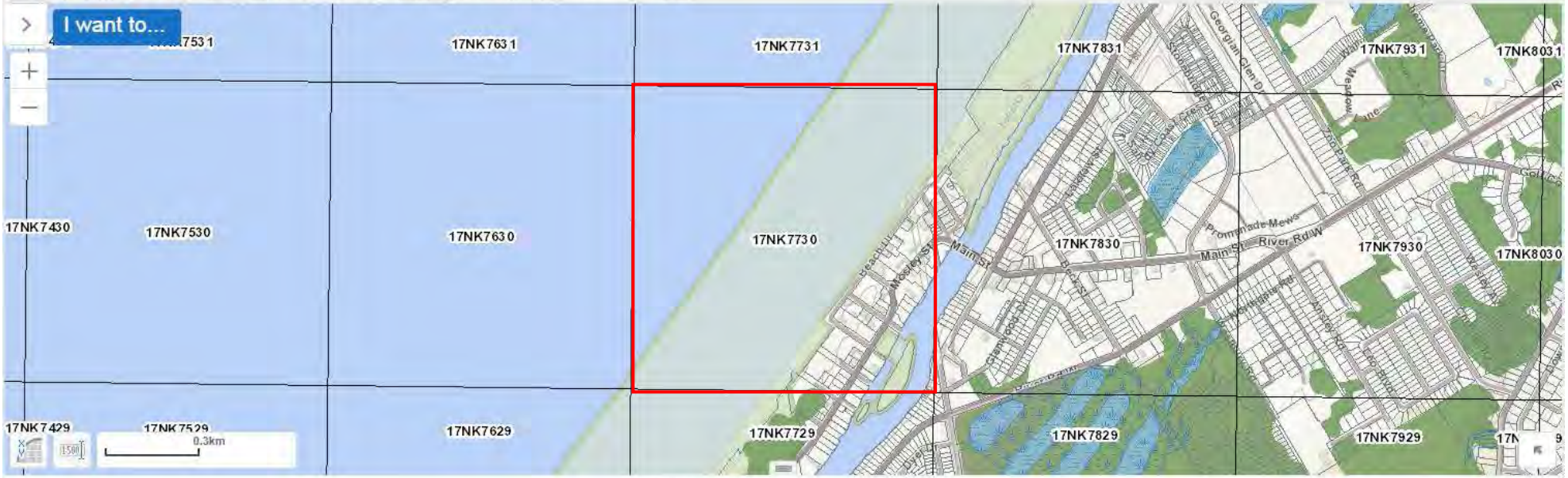
[Français]

Ontario **Ministry of Natural Resources and Forestry**
Make A Map: Natural Heritage Areas

Looking for a Park, Reserve or Wetland? Enter the name

About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978504

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
SPECIES	Piping Plover	Charadrius melodus	S1B	END	END	2009-07-20	332	http://nhic.mnr.gov.on.ca/re
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-16	4919	
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

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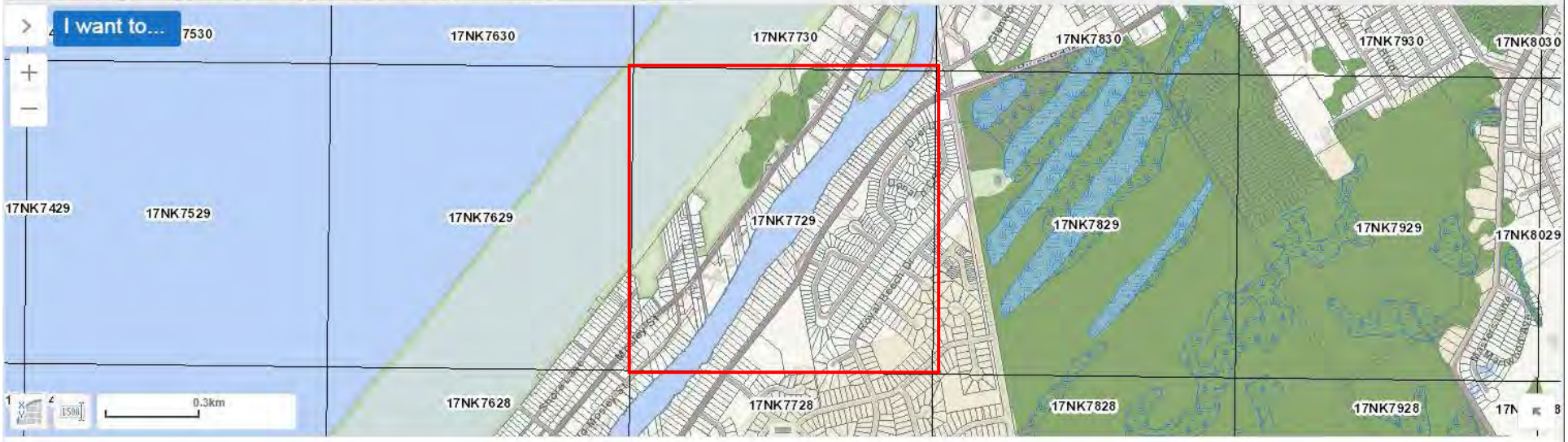

NHIC Data – Grid ID = 978413

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Prairie Warbler	Setophaga discolor	S3B	NAR	NAR	1927-06-09	21550	http://nhic.mnr.gov.on.ca/re
SPECIES	Woodland Pinedrops	Pterospora andromedea	S2			1948-07-28	33969	http://nhic.mnr.gov.on.ca/re
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

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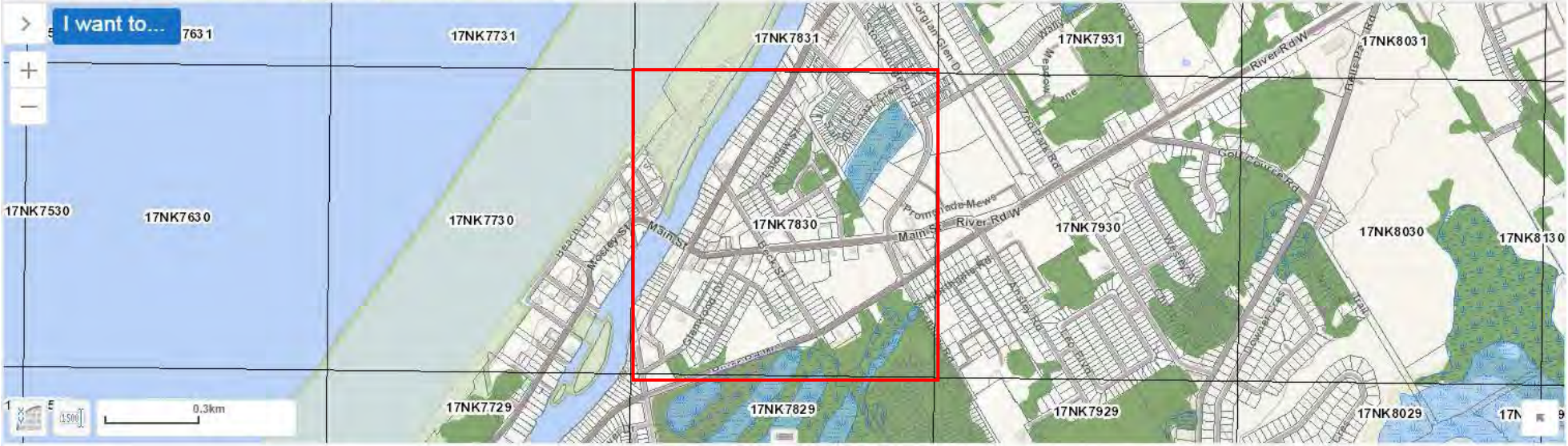
Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978514

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
SPECIES	Piping Plover	Charadrius melodus	S1B	END	END	2009-07-20	332	http://nhic.mnr.gov.on.ca/re
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-10-12	95737	http://nhic.mnr.gov.on.ca/re
SPECIES	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	Acipenser fulvescens pop. 3	S2	THR	THR	2010-09-01	104238	http://nhic.mnr.gov.on.ca/re

[Français]

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About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help

NHIC Data – Grid ID = 978423

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Spotted Wintergreen	Chimaphila maculata	S2	END	THR	1995-00-00	5506	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Woodland Pinedrops	Pterospora andromedea	S2			1948-07-28	33969	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Snapping Turtle	Chelydra serpentina	S3	SC	SC	2009-10-12	95737	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid
SPECIES	Rusty-patched Bumble Bee	Bombus affinis	S1	END	END	1941-08-21	116071	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgrid

[Français]

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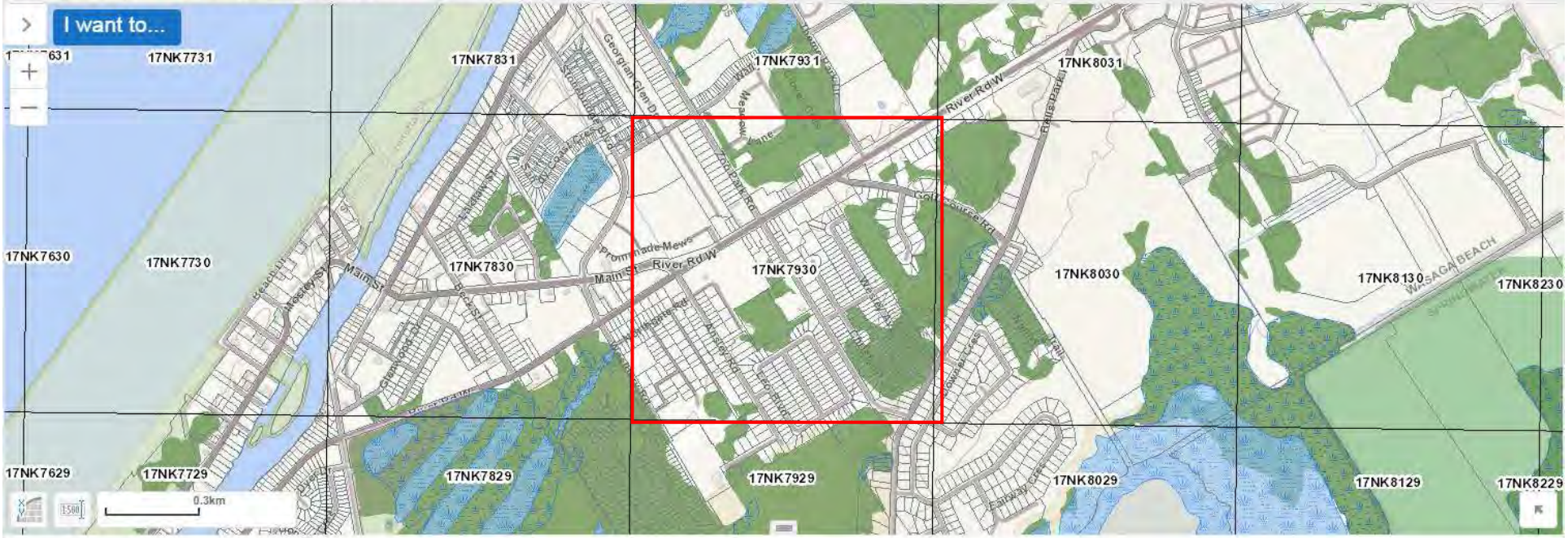

NHIC Data – Grid ID = 978524

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	

[Français]

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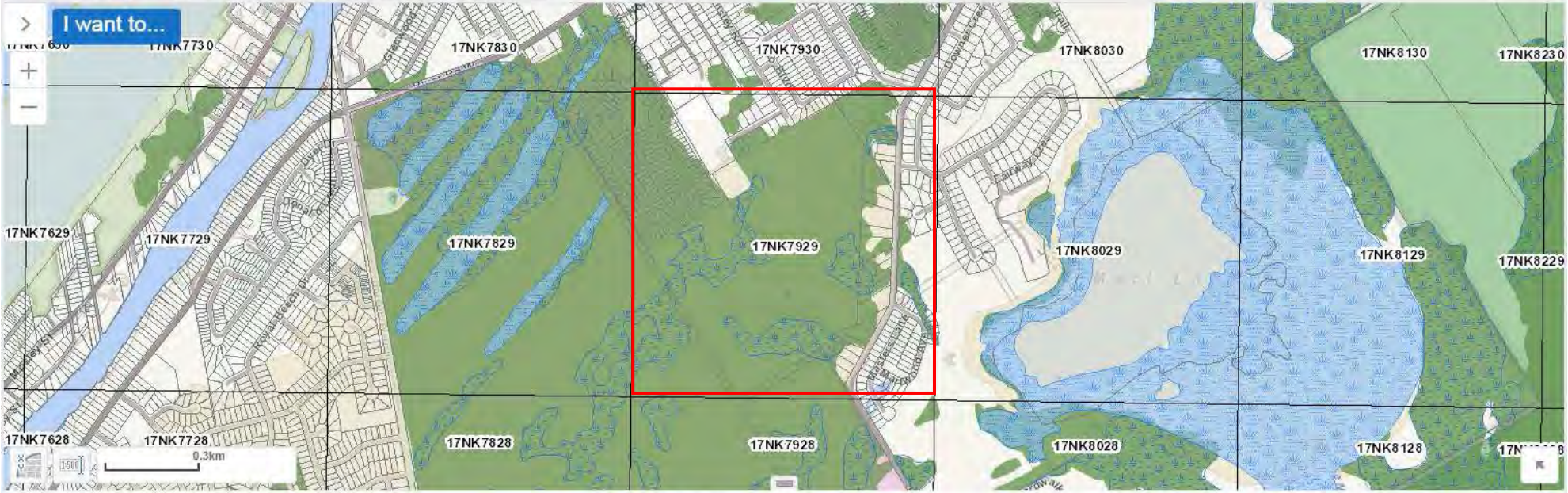
Search By Location | Point | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data – Grid ID = 978433

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				2010-07-18	4919	
SPECIES	Spotted Wintergreen	Chimaphila maculata	S2	END	THR	1995-00-00	5506	http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgriddetail&

From: Jason Runtas
Sent: Tuesday, December 03, 2019 10:48 AM
To: 'SAROntario@ontario.ca'
Subject: FW: Information Request for Main Street Revitalization - Class EA
Attachments: 18-351 MECP Information Request .pdf

Good afternoon,

I am writing this email to confirm that you have received the request below. I am wondering if you could provide me with an anticipated timeline for when I may receive a response.

Thanks,

Jason

From: Jason Runtas
Sent: Tuesday, October 22, 2019 9:15 AM
To: 'SAROntario@ontario.ca'
Subject: Information Request for Main Street Revitalization - Class EA

To whom it may concern,

Azimuth has been retained to provide natural heritage services toward a Schedule "C" Municipal Class Environmental Assessment for proposed improvements to Main Street from River Road West to Mosley Street, as well as Mosley Street from Main Street to 6th Street and Beach Drive, in the Town of Wasaga Beach.

We ask that you review the information package attached and confirm that the consolidated list of SAR expected to occur on the property and/or adjacent lands (*i.e.* up to 120m) includes all SAR of concern to the MECP. Additionally, we would like to take this opportunity to request any additional information related to natural heritage (including SAR and fisheries) on the property and adjacent lands that has not been made publically available.

Thank you and should you have any questions, do not hesitate to contact.

Kind regards,

Jason

Jason Runtas H.B.Sc.

Ecologist

Azimuth Environmental Consulting, Inc.
642 Welham Road, Barrie, ON, L4N 9A1
ph: (705) 721-8451 ext 228
cell: (705) 795-8451

jason@azimuthenvironmental.com
www.azimuthenvironmental.com

Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering

Jason Runtas H.B.Sc.

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cell: (705) 795-8451
jason@azimuthenvironmental.com
www.azimuthenvironmental.com

Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering

From: Jason Runtas
Sent: Tuesday, December 10, 2019 10:31 AM
To: 'SAROntario@ontario.ca'
Subject: FW: Information Request for Main Street Revitalization - Class EA
Attachments: 18-351 MECP Information Request .pdf

Good afternoon,

I am sending this email as a follow up to the one below to ensure the info request has been received.

Thank you for your consideration,

Jason

From: Jason Runtas
Sent: Tuesday, October 22, 2019 9:15 AM
To: 'SAROntario@ontario.ca'
Subject: Information Request for Main Street Revitalization - Class EA

To whom it may concern,

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cell: (705) 795-8451
jason@azimuthenvironmental.com
www.azimuthenvironmental.com

Providing services in hydrogeology, terrestrial and aquatic ecology & environmental engineering

From: Species at Risk (MECP) [SAROntario@ontario.ca]
Sent: Wednesday, July 10, 2019 3:47 PM
To: Jason Runtas
Subject: RE: Information Request for Joanne Crescent NHE
Attachments: DRAFT_Eastern Hog-nosed Snake_RS_Sept11.pdf

Hi Jason,

The RS 4919 is E. Hog-Nosed Snake. I recommend that you review the EHN Recovery Strategy and look for important habitat features in your field work. You should strive to maintain the existing treed corridor in this area. Please find attached list of possible SAR in Wasaga Beach.

SPECIES AT RISK IN THE TOWN OF WASAGA BEACH

Status for species as per the provincial **Species at Risk in Ontario (SARO) List**
SARO List -http://www.ontario.ca/environment-and-energy/species-risk

END - Endangered, **THR** - Threatened, **SC** - Special Concern

TAXA	SPECIES	STATUS (as of Jun 2016)	DESCRIPTION OF HABITAT USED	HABITAT PROTECTION UNDER ESA
Birds	Barn Swallow	THR	nest on ledges or walls in and outside of barns and other man made structures including buildings and bridges, may also use natural cliffs and caves.	General
Birds	Bank Swallow	THR	nest colonially in burrows, natural and human-made settings where there are vertical faces in silt and sand deposits, may nest on banks of rivers and lakes but can also be found in active or former sand and gravel pits	General
Bird	Black Tern	SC	large cattail marshes in wetlands	N/A
Bird	Bobolink	THR	hayfields and grassland habitats, pastures and some crop lands	General
Bird	Canada Warbler	SC	deciduous and coniferous forests, usually wet forest types with a well developed, dense shrub layer	N/A
Bird	Chimney Swift	THR	in and around urban settlements where they nest and roost in chimneys and other vertical manmade structures, will also use hollow trees or tree cavities in older growth forests, often near water	General
Bird	Common Nighthawk	SC	open areas with little to no ground vegetation, such as forest clearings, rock barrens, peat bogs, lakeshores and logged or burned over areas	N/A
Birds	Eastern Meadowlark	THR	native grasslands, pastures, agricultural fields especially in alfalfa and hay, old fields, meadows	General
Birds	Eastern Wood-Pewee	SC	intermediate-age mature forest stands with little understory vegetation, edges of deciduous and mixed forests	N/A
Bird	Golden-winged Warbler	SC	areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas	N/A
Bird	Grasshopper Sparrow	SC	prefers drier, sparsely vegetated grasslands, particularly rough or unimproved pastures at least 30 hectares in size supporting varying amounts of forbs and shrubs	N/A

Bird	Least Bittern	THR	large, quiet marshes with cattails	General
Bird	Olive-sided Flycatcher	SC	coniferous or mixed forest adjacent to wetlands or rivers	N/A
Bird	Piping Plover	END	wide open beaches along Lake Huron and Southern Georgian Bay shoreline	General
Bird	Red-headed Woodpecker	SC	nests in cavities in dead or mature trees, open woodland and woodland edges, especially in oak savannahs and riparian forest and habitats which contain a high density of dead trees,	N/A
Bird	Short-eared Owl	SC	open areas such as grasslands, marshes, wet meadows, fields and forest clearings	N/A
Bird	Whip-poor-will	THR	open woodlands or openings in mixed forests, rock or sand barrens with scattered trees, savannahs	General
Bird	Wood Thrush	SC	mature deciduous and mixed forests, moist stands of trees with developed undergrowth, prefer large forests, nests in live saplings, trees or shrubs	N/A
Fish	Lake Sturgeon	THR	inhabits the bottoms of shallow areas of large freshwater lakes and rivers, spawns in the Nottawasaga River	General
Insect	Monarch Butterfly	SC	wherever there are milkweed plants and wildflowers, often found in old fields, abandoned farmland and roadsides	N/A
Mammals	American Badger	END	found in remnant tallgrass prairie, sand barrens and farmland, wooded areas adjacent to farmland and ravines	Regulated
Mammal	Eastern Small-footed Bat	END	roost under rocks, rock outcrops, in buildings, under bridges or in caves, mines or hollow trees	General
Mammal	Little Brown Bat	END	roost in trees or buildings during the day, often select attics, abandoned buildings and barns for summer colonies. Hibernate in caves and abandoned mines	General
Mammal	Northern Long-eared Bat	END	roost under loose bark and in the cavities of trees, hibernate in caves or abandoned mines	General
Mammal	Tri-coloured Bat	END	found in a variety of forested habitats, maternity colonies may found in trees, rock crevices, and barns or other buildings. Hibernate in caves, mines and tunnels.	General
Plant	Butternut	END	found in variety of sites, commonly in forest openings, old fields, hedgerows, on floodplains, stream sides or gradual slopes.	General
Plant	Hill's Thistle	THR	open sunny sites, including prairies and woodland alvars.	General
Plant	Spotted Wintergreen	END	dry, oak-pine woodland habitats with sandy soils	General
Reptile	Eastern Hog-nosed Snake	THR	sandy, well-drained habitats including dry woods, open sandy areas, fields and shrublands and wetlands	General
Reptile	Eastern Musk Turtle (Stinkpot)	SC	shallow, slow-moving water around Georgian Bay	N/A
Reptile	Northern Map Turtle	SC	large rivers and lakes	N/A
Reptile	Snapping Turtle	SC	very aquatic species, spend most of their lives in water, prefers shallow water in wetland habitats.	N/A

Jody Scheifley
Management Biologist | Permissions and Compliance Section, Species at Risk Branch
Ministry of Environment, Conservation and Parks
519-371-8422
1450 7TH Avenue East Owen Sound, Ontario, N4K 2Z1

From: Jason Runtas <jruntas@azimuthenvironmental.com>
Sent: July 5, 2019 8:59 AM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: Information Request for Joanne Crescent NHE

To whom it may concern,

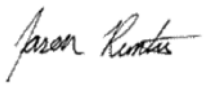
Azimuth has been retained to complete a Natural Heritage Evaluation for a property located in Part of Lot 32, Concession 1 (Joanne Crescent), Town of Wasaga Beach.

We ask that you review the information package attached and confirm that the consolidated list of SAR expected to occur on the property and/or adjacent lands (*i.e.* up to 120m) includes all SAR of concern to the MECP. Additionally, we would like to take this opportunity to request any additional information related to natural heritage (including SAR and fisheries) on the property and adjacent lands that has not been made publically available.

A restricted species was identified during a review of NHIC's mapping software in square 17NK7124. The EO ID for this species is 4919. Azimuth will protect the identity of "Restricted" SAR within our report that could potentially be made publically available.

Thank you and should you have any questions, do not hesitate to contact.

Kind regards,



Jason Runtas H.B.Sc.

Ecologist

Azimuth Environmental Consulting, Inc.
642 Welham Road, Barrie, ON, L4N 9A1
ph: (705) 721-8451 ext 228
cell: (705) 795-8451
jason@azimuthenvironmental.com
www.azimuthenvironmental.com

Scott Tarof

From: Scott Martin
Sent: Tuesday, December 15, 2020 12:22 PM
To: Scott Tarof
Subject: FW: Information Request for Main Street Revitalization - Class EA

From: Eplett, Megan (MECP) [mailto:Megan.Eplett@ontario.ca]
Sent: Wednesday, January 08, 2020 3:52 PM
To: Jason Runtas
Subject: RE: Information Request for Main Street Revitalization - Class EA

Hello Jason,

Thank you for contacting MECP about the Main Street Revitalization EA in the Town of Wasaga Beach. I have reviewed your list of SAR species and have no additions to make. It is likely the restricted record is [redacted].

As there are several confirmed species at risk within the vicinity of the study area please continue to do keep MECP informed as the project progresses so we may provide advice on how to minimize impacts to species at risk and their habitats.

Thank you,

Megan

Megan Eplett | Management Biologist | Permissions and Compliance | Species at Risk Branch | Ontario Ministry of Environment, Conservation and Parks
50 Bloomington Road, Aurora, Ontario, L4G 0L8 | Phone: 289-221-1794 | Email: megan.eplett@ontario.ca

---

From: Jason Runtas <jruntas@azimuthenvironmental.com>
Sent: December 10, 2019 10:31 AM
To: Species at Risk (MECP) <SAROntario@ontario.ca>
Subject: FW: Information Request for Main Street Revitalization - Class EA

Good afternoon,

I am sending this email as a follow up to the one below to ensure the info request has been received.

Thank you for your consideration,

Jason

From: Jason Runtas
Sent: Tuesday, October 22, 2019 9:15 AM

To: 'SAROntario@ontario.ca'
Subject: Information Request for Main Street Revitalization - Class EA

To whom it may concern,

Azimuth has been retained to provide natural heritage services toward a Schedule "C" Municipal Class Environmental Assessment for proposed improvements to Main Street from River Road West to Mosley Street, as well as Mosley Street from Main Street to 6th Street and Beach Drive, in the Town of Wasaga Beach.

We ask that you review the information package attached and confirm that the consolidated list of SAR expected to occur on the property and/or adjacent lands (*i.e.* up to 120m) includes all SAR of concern to the MECP. Additionally, we would like to take this opportunity to request any additional information related to natural heritage (including SAR and fisheries) on the property and adjacent lands that has not been made publically available.

Thank you and should you have any questions, do not hesitate to contact.

Kind regards,

Jason

Jason Runtas H.B.Sc.

Ecologist

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APPENDIX G

Alternative Design Options

ALTERNATIVE SOLUTIONS

Alternative Solutions were presented at PIC 1 to illustrate different options to addressing the Problem/Opportunity Statement in consideration of the following:

RIGHT-OF-WAY
What is the available road right-of-way within which the improvements must be assembled?

VEHICLES
What is the most appropriate manner to address more vehicle travel demands?

PARKING
What is the most appropriate manner to accommodate demands for parking?

BICYCLES
What is the most appropriate manner to address bicycle travel demands?

PEDESTRIANS
What is the most appropriate manner to address pedestrian travel demands?

RETAIL / COMMERCIAL
What opportunities can be provided to support retail / commercial development?

EVALUATION OF SOLUTIONS

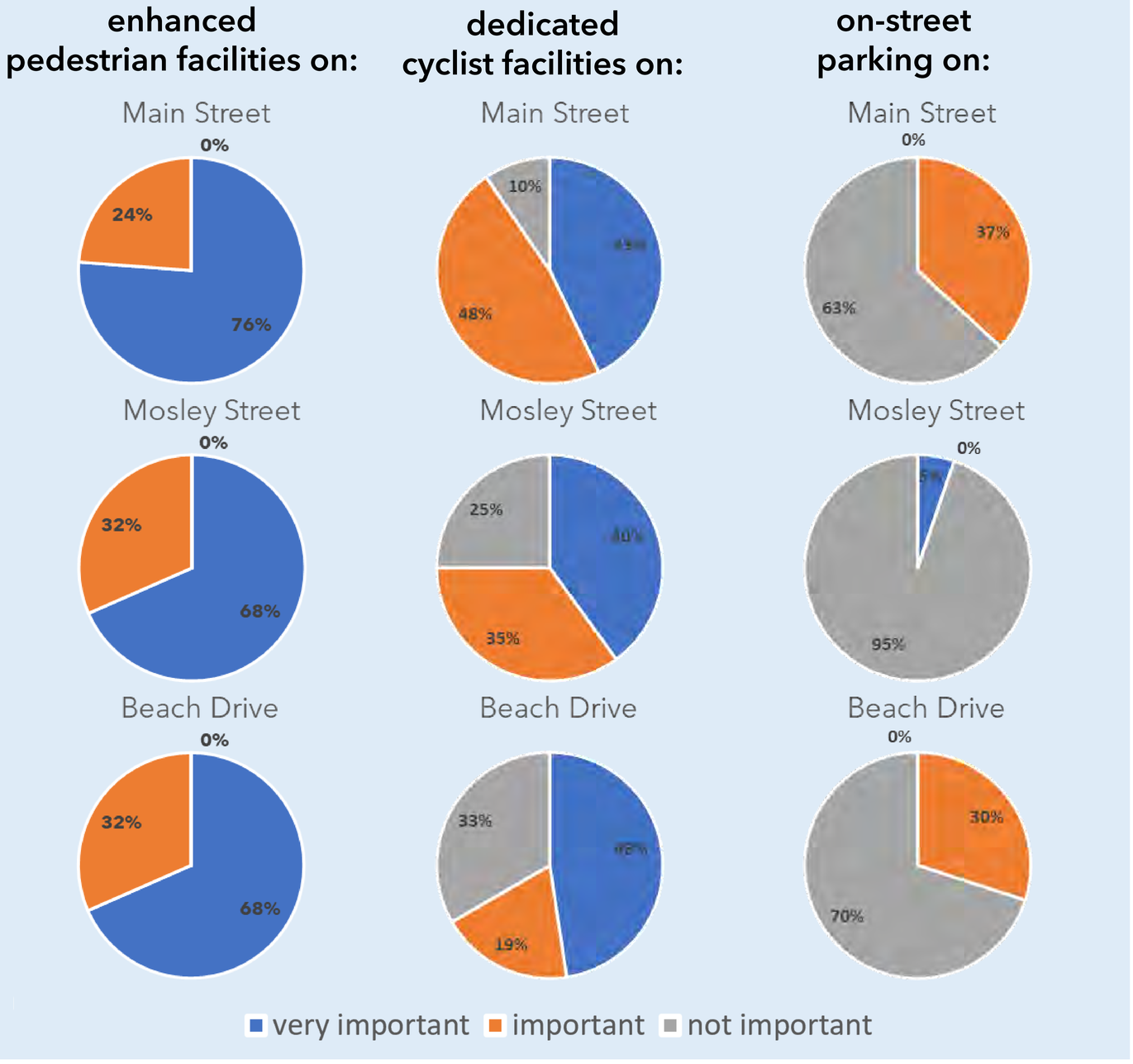
The Alternative Solutions were evaluated based on their ability to achieve the study objectives (namely to accommodate future travel needs of all road users -motorists, cyclists & pedestrians) and the resulting impacts to the following environments:

Transportation **Natural** **Cultural** **Social** **Economic**

SUMMARY OF PUBLIC INPUT

At PIC 1, a Public Comment Sheet was made available to further solicit input pertaining to the Alternative Solutions and those elements that are of most importance to the public. Respondents were asked:

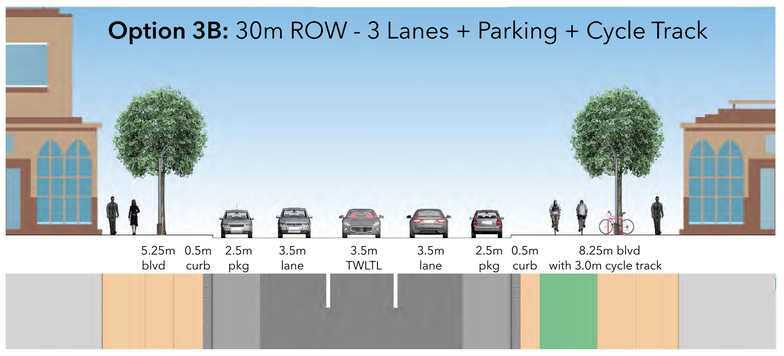
How important is it for you to have …



PREFERRED SOLUTIONS

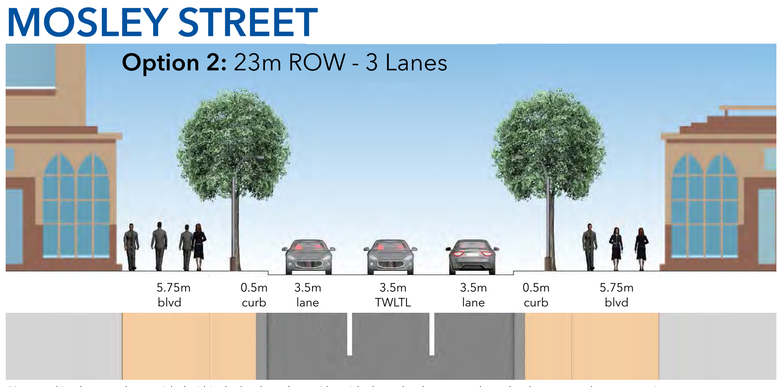
The Preferred Solutions were based on the evaluation, consultation with the Town and consideration of the public input received.

MAIN STREET



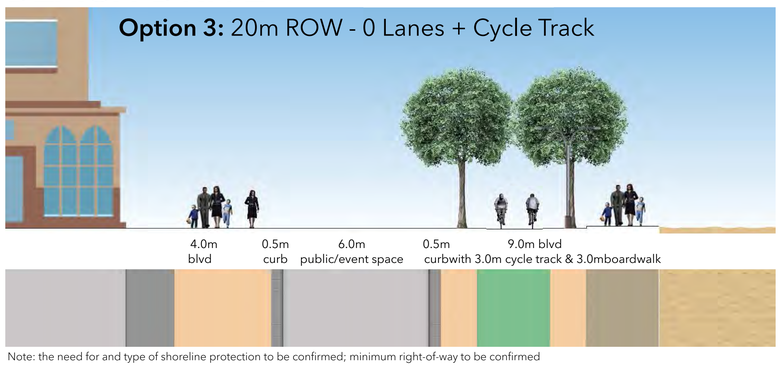
Note: parking lanes can be converted to bump-outs at intersections or at select mid-block locations to increase boulevard space and public realm opportunities

MOSLEY STREET



Note: parking bays can be provided within the boulevards on either side through select areas where development and space permit

BEACH DRIVE

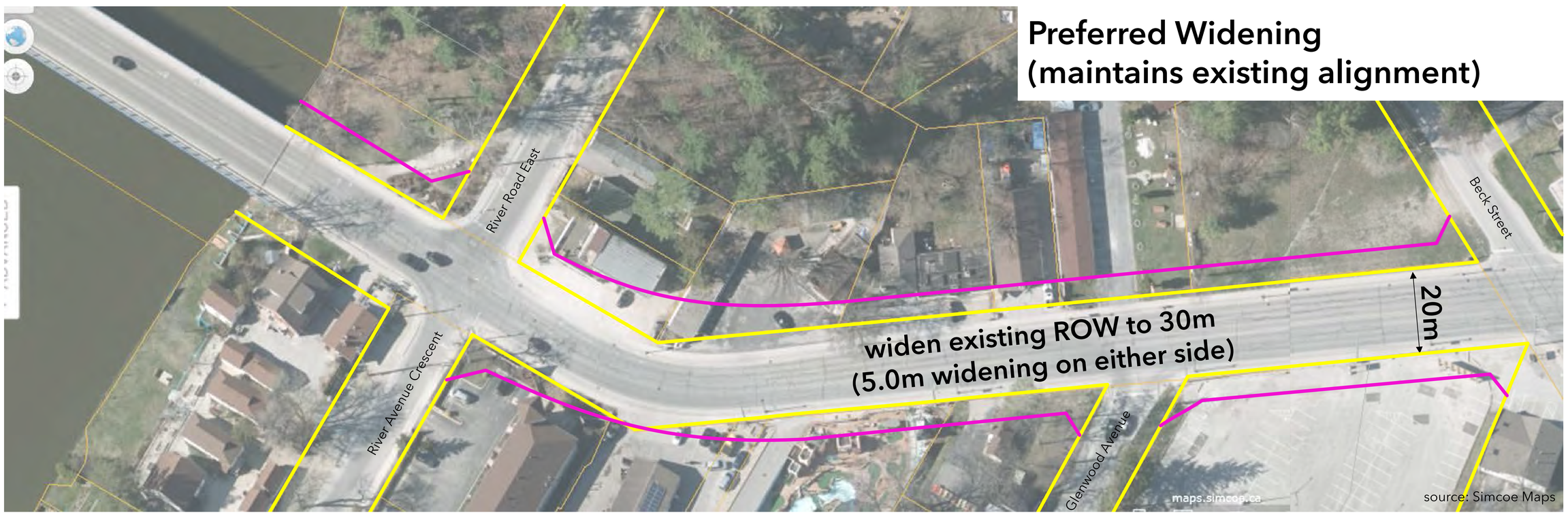


Note: the need for and type of shoreline protection to be confirmed; minimum right-of-way to be confirmed

Main Street and Beach Areas 1 & 2 Improvements

RECAP OF PREFERRED SOLUTIONS

MAIN STREET



EVALUATION OF OPTIONS

River Road West to Beck Street

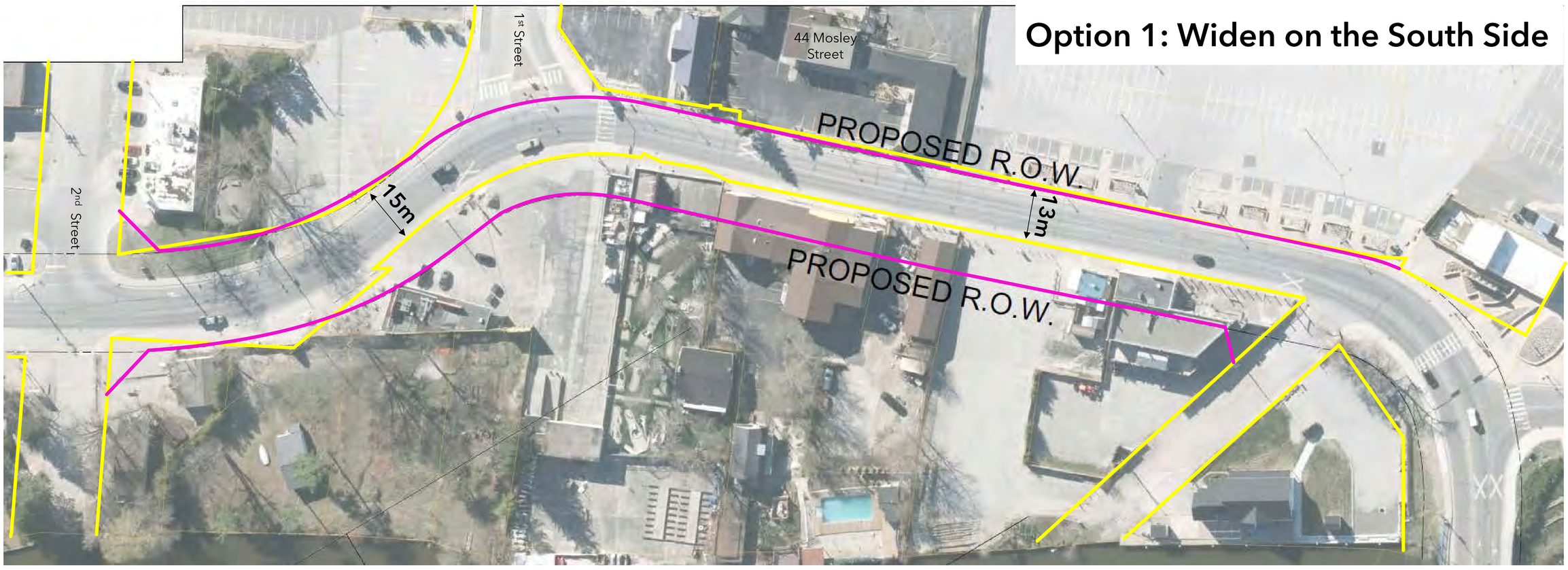
Existing right-of-way is 30 metres (or greater) and thus no additional widening is required.

Beck Street to the River

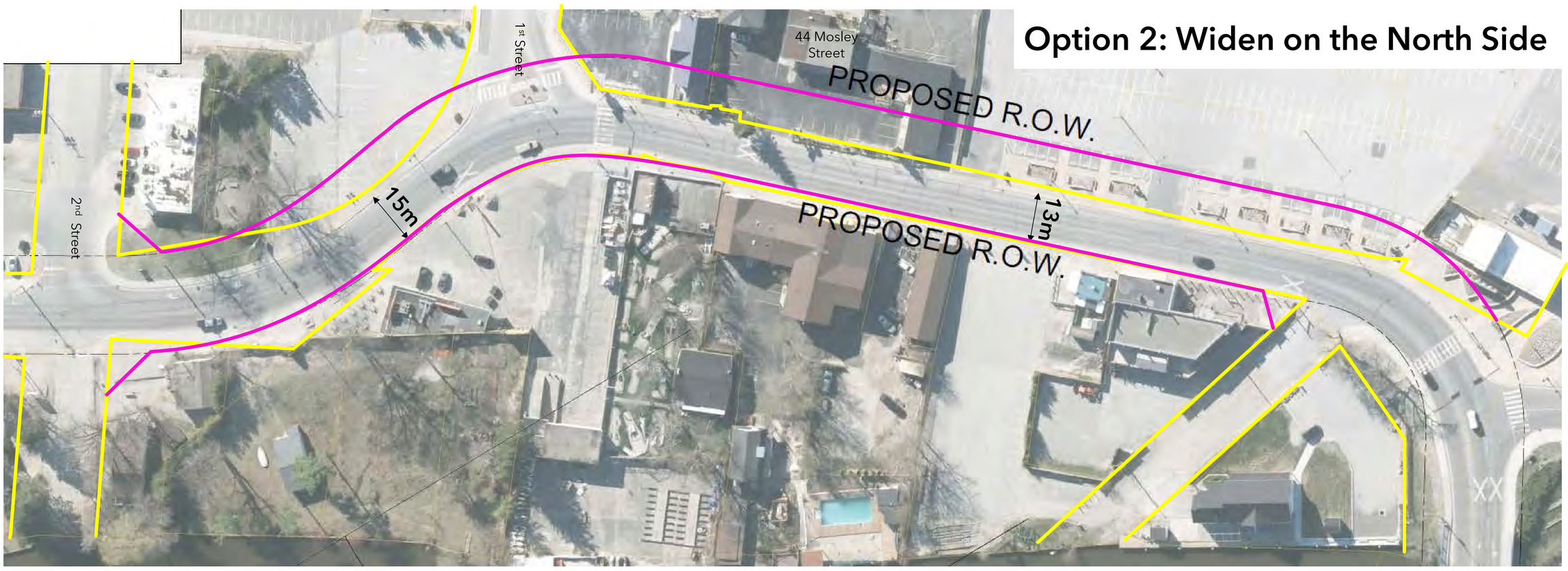
The preferred option is to widen 5.0 metres on both sides, matching the existing 30 metre ROW to the east of Beck Street. This is consistent with the Town's Official Plan and Community Improvement Program policies in place.

MOSLEY STREET – Spruce Street to 2nd Street

Option 1: Widen on the South Side

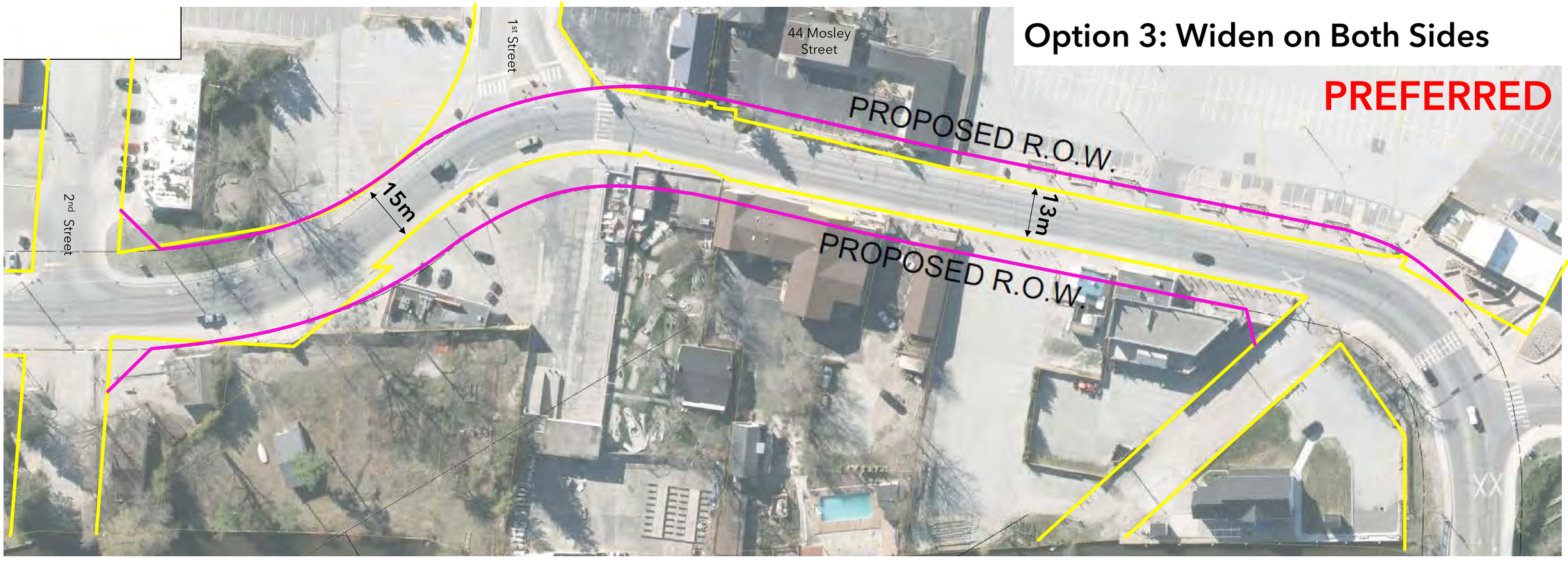


Option 2: Widen on the North Side



Option 3: Widen on Both Sides

PREFERRED



source: Simcoe Maps

existing right-of-way

proposed 23m right-of-way

TOWN OF WASAGA BEACH INCORPORATED 1974

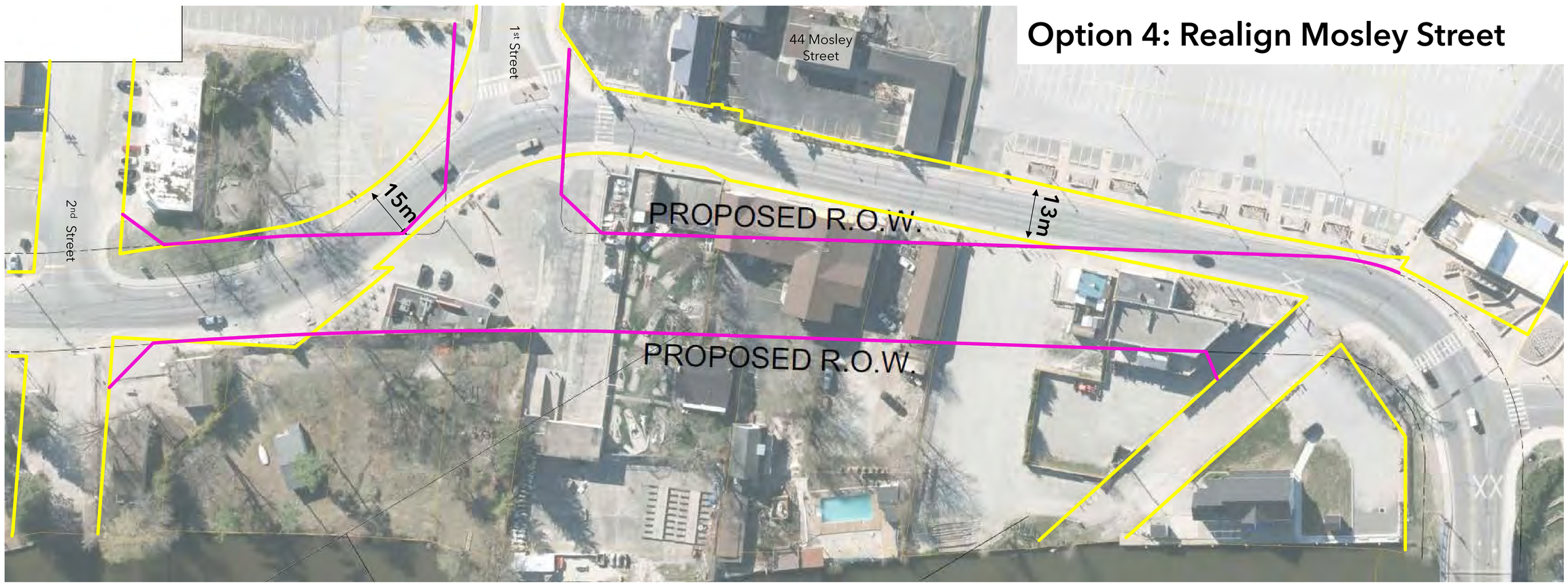
Main Street and Beach Areas 1 & 2 Improvements

ROAD ALIGNMENT & WIDENING

TATHAM ENGINEERING

ENVISIONTATHAM

MOSLEY STREET – Spruce St to 2nd Street (cont'd)



MOSLEY STREET – 2nd Street to 6th Street

source: Simcoe Maps

existing right-of-way proposed 23m right-of-way

EVALUATION OF OPTIONS

Spruce Street to 2nd Street

The preferred option to widen Mosley Street to provide a 23m right-of-way is Option 3: Widen on Both Sides

- attempts to balance the impacts to development lands and redevelopment potential on both sides of the road
- Options 1 and 4 have increased impacts to the south side and hence hinder development/redevelopment potential; Option 2 has increased impacts on the north side

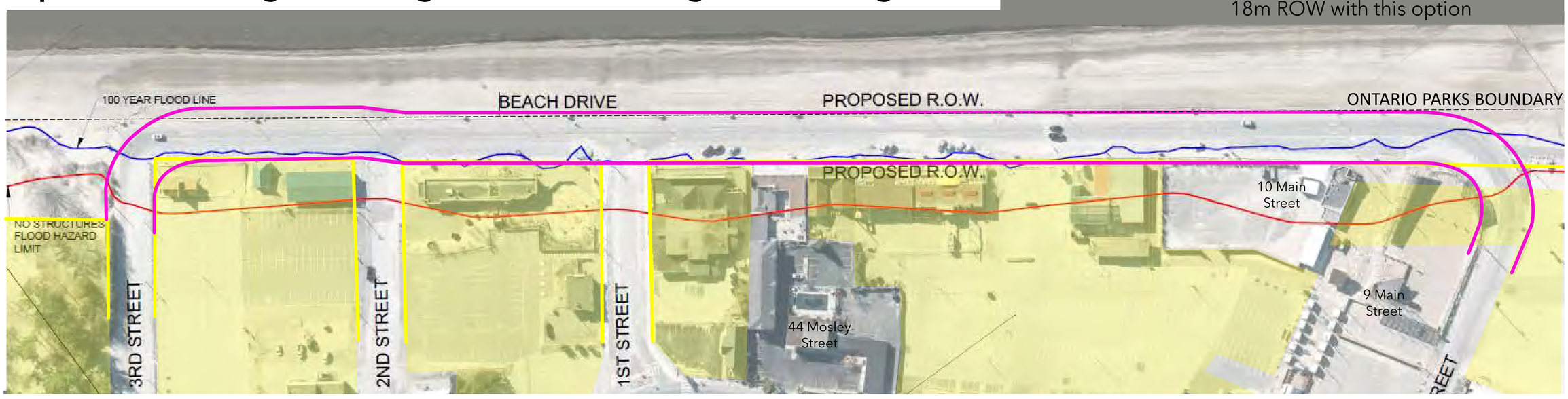
2nd Street to 6th Street

The preferred option to widen Mosley Street is simply to best fit the existing right-of-way, attempting to minimize and balance impacts on both sides.

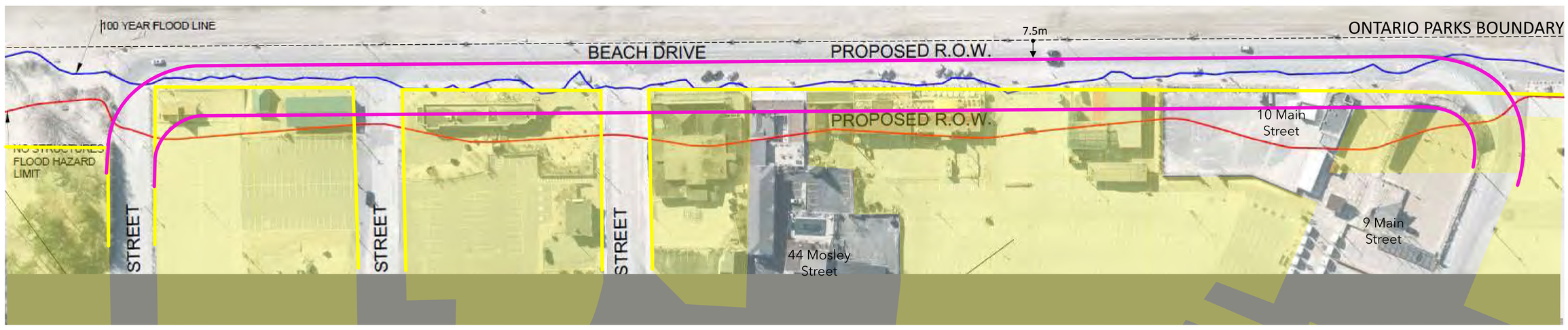
BEACH DRIVE

Option 1: Existing Road Alignment (south edge at buildings)

Note: could also maintain the existing 18m ROW with this option

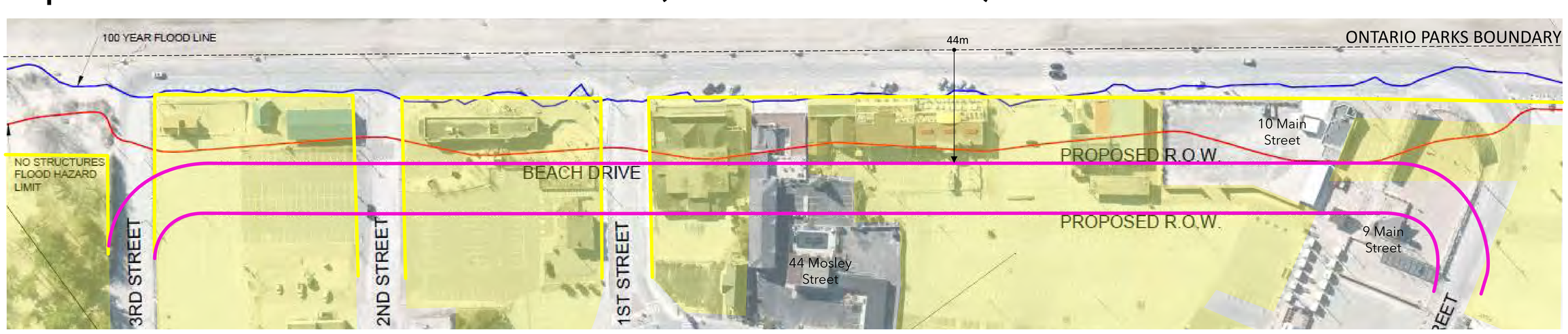


Option 2: Recover Minimum Beach (shift of 7.5 metres south) PREFERRED



Option 3: 100 Year Flood Line (shift of 22 metres south)

Option 4: No Structure Flood Hazard Limit (shift 44 metres south)



existing right-of-way | Town property | proposed 20m right-of-way

EVALUATION OF OPTIONS

The preferred option to provide a 20m right-of-way is Option 2: Recover Minimum Beach

- provides an increased minimum area of beach during high water periods
- maximizes remaining development lands to the south
- ensures existing Ontario Parks boundary can be respected

TOWN OF WASAGA BEACH INCORPORATED 1974

Main Street and Beach Areas 1 & 2 Improvements

ROAD ALIGNMENT & WIDENING

TATHAM ENGINEERING

ENVISIONTATHAM

Appendix H: Stage 1 Archaeological Assessment

ARCHAEOLOGY | HERITAGE | OUTREACH | EDUCATION

DRAFT

Stage 1 Archaeological Assessment
Main Street Reconstruction & Downtown Revitalization
Municipal Class Environmental Assessment
Town of Wasaga Beach
Part of Lots 26–27, Concession 9
Geographic Township of Flos
Part of Lots 9–10, Concession 16
Geographic Township of Sunnidale
Simcoe County, Ontario

Prepared for
C.C. Tatham & Associates Ltd.
115 Sanford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
Tel: (705) 444-2565 Fax: (705) 444-2327

Licensed under
P.J. Racher
MHSTCI Licence #P007
PIF #P007-1068-2019
ARA File #2018-0381

02/04/2020

Original Report

219 - 900 Guelph Street, Kitchener, ON N2H 5Z6
P - 519.804.2291 F - 519.286.0493
arch-research.com

EXECUTIVE SUMMARY

Under a contract awarded in July 2019, Archaeological Research Associates Ltd. carried out a Stage 1 assessment for the proposed Main Street Reconstruction and Downtown Revitalization project in the Town of Wasaga Beach, Simcoe County, Ontario. The project includes the proposed revitalization to the Main Street (River Road West to Mosely Street), Mosley Street (Main Street to 6th Street) and Beach Drive corridors and portions of cross-streets. The assessment was conducted as part of a Schedule C Municipal Class Environmental Assessment in accordance with the *Environmental Assessment Act*. This report documents the background research and potential modelling involved in the assessment, and presents conclusions and recommendations pertaining to archaeological concerns within the study area.

The Stage 1 assessment was conducted in November 2019 under Project Information Form #P007-1068-2019. The investigation encompassed the entirety of the project lands. All field observations were made from accessible public areas; accordingly, no permissions were required for property access. At the time of assessment, the study area comprised an assortment of roadway platforms, shoulders, ditches and sidewalks associated with Main Street, Mosley Street, Beach Drive, Stonebridge Boulevard, Wood Avenue, Elm Drive, Beck Street, Glenwood Drive, River Avenue Crescent, River Road East, Jenetta Street, Spruce Street, Willow Street, 1st Street, 2nd Street and 3rd Street, as well as adjacent driveways, maintained lawns, treed areas and portions of sandy beach.

The Stage 1 assessment determined that the study area comprised a mixture of areas of archaeological potential, areas of no archaeological potential and previously assessed lands of no further concern. Archaeological Research Associates Ltd. recommends that all identified areas of archaeological potential that could be impacted by the project be subject to a Stage 2 property assessment in accordance with Section 2.1 of the 2011 *Standards and Guidelines for Consultant Archaeologists*.

The identified areas of no archaeological potential and previously assessed lands of no further concern do not require any additional assessment. Given that there are still outstanding archaeological concerns within the subject lands, no ground alterations or development of any kind may occur until the Stage 2 assessment is complete, a recommendation that the lands require no further archaeological assessment is made, and the associated report is entered into the Ontario Public Register of Archaeological Reports.

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GLOSSARY OF ABBREVIATIONS

ARA – Archaeological Research Associates Ltd.
EA – Environmental Assessment
MHSTCI – Ministry of Heritage, Sport, Tourism and Culture Industries
PIF – Project Information Form
PTP – Positive Test Pit
ROW – Right of Way
S&Gs – Standards and Guidelines for Consultant Archaeologists

PERSONNEL

Project Director: P.J. Racher (#P007)
Operations Manager: C.E. Gohm (#R187)
Project Manager: M. Maika (#P1021)
Field Director: S. Clarke (#R446)
Cartographers: A. Bailey (#R1069), K. Brightwell (#R341)
Report Writer: L. Zepf (#P1033)
Editor: C.J. Gohm

1.0 PROJECT CONTEXT

1.1 Development Context

Under a contract awarded in July 2019, ARA carried out a Stage 1 assessment for the proposed Main Street Reconstruction and Downtown Revitalization project in the Town of Wasaga Beach, Simcoe County, Ontario. The project includes the proposed revitalization to the Main Street (River Road West to Mosely Street), Mosley Street (Main Street to 6th Street) and Beach Drive corridors and portions of cross-streets. The assessment was conducted as part of a Schedule C Municipal Class EA in accordance with the *Environmental Assessment Act*. This report documents the background research and potential modelling involved in the assessment, and presents conclusions and recommendations pertaining to archaeological concerns within the study area.

The Main Street Reconstruction and Downtown Revitalization EA study aims to identify various alternatives to implementing the improvements, with consideration given to road widening, intersection improvements, roundabouts and pedestrian and cycling facilities. The improvements were deemed necessary to facilitate and support future growth and ensure that future transportation and infrastructure demands can be accommodated. Main and Mosley Streets are part of the key corridors in the Town of Wasaga Beach important in servicing commuter, recreational and tourist traffic. Currently, Mosley Street is a two-lane road with a rural cross-section (i.e., partly paved shoulders and open ditches) to 3rd Street at which point it transitions to an urban cross section (i.e., curbs, gutters and sidewalks) from 3rd Street north to Main Street. Main Street is a three-lane road with an urban cross-section from Mosley Street to approximately Glenwood Drive, at which point it becomes four lanes in the remainder of the study area to River Road West. The side streets included in the west side of the study area exhibit rural cross-sections, while those east of the Main Street Bridge include a mix of both urban and rural configurations.

The subject study area consists of an irregularly-shaped parcel of land with a total area of 15.93 ha (Map 1). This parcel is within the downtown core of Wasaga Beach and is generally bounded by the beach and Nottawasaga Bay to the northwest and commercial and residential lands in the other cardinal directions. It is traversed by the current Main Street, Mosley Street, Beach Drive, Stonebridge Boulevard, Wood Avenue, Elm Drive, Beck Street, Glenwood Drive, River Avenue Crescent, River Road East, Jenetta Street, Spruce Street, Willow Street, 1st Street, 2nd Street and 3rd Street ROWs. The study area is on either side of the Nottawasaga River, connected via the Main Street bridge, the eastern portion being situated on the mainland and the western portion on the narrow, elongated sand spit. The course of the Nottawasaga River runs northeast-southwest through the study area to its embouchure with Nottawasaga Bay to the northeast. In legal terms, the study area falls on part of Lots 26–27, Concession 9 in the Geographic Township of Flos and part of Lots 9–10, Concession 16 in the Geographic Township of Sunnidale, Simcoe County.

The Stage 1 assessment was conducted in November 2019 under PIF #P007-1068-2019. The investigation encompassed the entirety of the project lands. All field observations were made from accessible public areas; accordingly, no permissions were required for property access. In compliance with the objectives set out in Section 1.0 of the 2011 *S&Gs*, this investigation was carried out in order to:

- Provide information concerning the geography, history and current land condition of the study area;
- Determine the presence of known archaeological sites in the study area;
- Present strategies to mitigate project impacts to such sites, if they are located;
- Evaluate in detail the archaeological potential of the study area; and
- Recommend appropriate strategies for Stage 2 archaeological assessment, if some or all of the study area has archaeological potential.

The MHSTCI is asked to review the results and recommendations presented herein and enter the report into the Ontario Public Register of Archaeological Reports. ARA did not engage with any Indigenous groups over the course of the subject investigation.

1.2 Historical Context

After a century of archaeological work in southern Ontario, scholarly understanding of the historic usage of the area has become very well-developed. With occupation beginning in the Palaeo period approximately 11,000 years ago, the greater vicinity of the study area comprises a complex chronology of Indigenous and Euro-Canadian histories. Section 1.2.1 summarizes the region's settlement history, whereas Section 1.2.2 documents the study area's past and present land uses. Multiple previous archaeological reports containing relevant background information were obtained during the research component of the study. These reports are summarized in Section 1.3.3, and the references (including title, author and PIF number) appear in Section 7.0.

1.2.1 Settlement History

1.2.1.1 Pre-Contact

The Pre-Contact history of the region is lengthy and rich, and a variety of Indigenous groups inhabited the landscape. Archaeologists generally divide this vibrant history into three main periods: Palaeo, Archaic and Woodland. Each of these periods comprises a range of discrete sub-periods characterized by identifiable trends in material culture and settlement patterns, which are used to interpret indigenous lifeways. The principal characteristics of these sub-periods are summarized in Table 1.

Table 1: Pre-Contact Settlement History
(Wright 1972; Ellis and Ferris 1990; Warrick 2000; Munson and Jamieson 2013)

Sub-Period	Timeframe	Characteristics
Early Palaeo	9000–8400 BC	Gainey, Barnes and Crowfield traditions; Small bands; Mobile hunters and gatherers; Utilization of seasonal resources and large territories; Fluted projectiles
Late Palaeo	8400–7500 BC	Holcombe, Hi-Lo and Lanceolate biface traditions; Continuing mobility; Campsite/Way-Station sites; Smaller territories are utilized; Non-fluted projectiles
Early Archaic	7500–6000 BC	Side-notched, Corner-notched (Nettling, Thebes) and Bifurcate traditions; Growing diversity of stone tool types; Heavy woodworking tools appear (e.g., ground stone axes and chisels)

Sub-Period	Timeframe	Characteristics
Middle Archaic	6000–2500 BC	Stemmed (Kirk, Stanly/Neville), Brewerton side- and corner-notched traditions; Reliance on local resources; Populations increasing; More ritual activities; Fully ground and polished tools; Net-sinkers common; Earliest copper tools
Late Archaic	2500–900 BC	Narrow Point (Lamoka), Broad Point (Genesee) and Small Point (Crawford Knoll) traditions; Less mobility; Use of fish-weirs; True cemeteries appear; Stone pipes emerge; Long-distance trade (marine shells and galena)
Early Woodland	900–400 BC	Meadowood tradition; Crude cord-roughened ceramics emerge; Meadowood cache blades and side-notched points; Bands of up to 35 people
Middle Woodland	400 BC–AD 600	Point Peninsula tradition; Vinette 2 ceramics appear; Small camp sites and seasonal village sites; Influences from northern Ontario and Hopewell area to the south; Hopewellian influence can be seen in continued use of burial mounds
Middle/Late Woodland Transition	AD 600–900	Gradual transition between Point Peninsula and later traditions; Princess Point tradition emerges elsewhere (i.e., in the vicinity of the Grand and Credit Rivers)
Late Woodland (Early)	AD 900–1300	Glen Meyer tradition; Settled village-life based on agriculture; Small villages (0.4 ha) with 75–200 people and 4–5 longhouses; Semi-permanent settlements
Late Woodland (Middle)	AD 1300–1400	Uren and Middleport traditions; Classic longhouses emerge; Larger villages (1.2 ha) with up to 600 people; More permanent settlements (30 years)
Late Woodland (Late)	AD 1400–1600	Huron-Petun tradition; Globular-shaped ceramic vessels, ceramic pipes, bone/antler awls and beads, ground stone celts and adzes, chipped stone tools, and even rare copper objects; Large villages (often with palisades), temporary hunting and fishing camps, cabin sites and small hamlets; Territorial contraction in early 16th century; Fur trade begins ca. 1580; European trade goods appear

Although Iroquoian-speaking populations tended to leave a much more obvious mark on the archaeological record and are therefore emphasized in the Late Woodland entries above, it must be understood that Algonquian-speaking populations also represented a significant presence in southern Ontario. Due to the sustainability of their lifeways, archaeological evidence directly associated with the Anishinaabeg remains elusive, particularly when compared to sites associated with the more sedentary agriculturalists. Many artifact scatters in southern Ontario were likely camps, chipping stations or processing areas associated with the more mobile Anishinaabeg, utilized during their travels along the local drainage basins while making use of seasonal resources. This part of southern Ontario represents the ancestral territory of various Indigenous groups, each with their own land use and settlement pattern tendencies.

1.2.1.2 Post-Contact

The arrival of European explorers and traders at the beginning of the 17th century triggered widespread shifts in Indigenous lifeways and set the stage for the ensuing Euro-Canadian settlement process. Documentation for this period is abundant, ranging from the first sketches of Upper Canada and the written accounts of early explorers to detailed township maps and lengthy histories. The Post-Contact period can be effectively discussed in terms of major historical events, and the principal characteristics associated with these events are summarized in Table 2.

Table 2: Post-Contact Settlement History
(Smith 1846; Coyne 1895; Hunter 1909a, 1909b; Lajeunesse 1960; Cumming 1975; Ellis and Ferris 1990; Surtees 1994; Watson 2009; AO 2015)

Historical Event	Timeframe	Characteristics
Early Exploration	Early 17th century	Brûlé explores southern Ontario in 1610; Champlain travels through in 1613 and 1615/1616, encountering a variety of Indigenous groups (including both Iroquoian-speakers and Algonquian-speakers); European goods begin to replace traditional tools
Increased Contact and Conflict	Mid- to late 17th century	Conflicts between various First Nations during the Beaver Wars result in numerous population shifts; European explorers continue to document the area, and many Indigenous groups trade directly with the French and English; 'The Great Peace of Montreal' treaty established between roughly 39 different First Nations and New France in 1701
Fur Trade Development	Early to mid-18th century	Growth and spread of the fur trade; Peace between the French and English with the Treaty of Utrecht in 1713; Ethnogenesis of the Métis; Hostilities between French and British lead to the Seven Years' War in 1754; French surrender in 1760
British Control	Mid-18th century	*Royal Proclamation* of 1763 recognizes the title of the First Nations to the land; Numerous treaties subsequently arranged by the Crown; First land cession under the new protocols is the Seneca surrender of the west side of the Niagara River in 1764; The Niagara Purchase (Treaty 381) in 1781 included the surrendered lands and addressed the Mississaugas' claim to the area
Loyalist Influx	Late 18th century	United Empire Loyalist influx after the American Revolutionary War (1775–1783); British develop interior communication routes and acquire additional lands; John Collins acquires the northern part of the Toronto Carrying Place in 1785 (subject to a confirmatory surrender in the Williams Treaties of 1923); *Constitutional Act* of 1791 creates Upper and Lower Canada
County Development	Late 18th to early 19th century	Became part of the expansive Kent County in 1792; Nominally became part of Simcoe County in 1798; Additional land cessions included the Penetanguishene Purchase (Treaty 5) in 1798, Lake Simcoe Purchase (Treaty 16) in 1815 and Nottawasaga Purchase (Treaty 18) in 1818; All townships surveyed by the mid-1830s; Townships ceded to Waterloo County in 1837 and York County in 1838; Simcoe County independent after the abolition of the district system in 1849
Township Formation	Early 19th century	Flos: Partially surveyed in 1811 by Samuel Wilmot during the establishment of the Penetanguishene Road; John Goessman surveyed the remainder of the township in 1821/22; Settlement was initially slow due to dense forest and poor soils for agriculture; Many of the earliest settlers were retired military officers; One of the first settlers was David McDougall in 1826, and the Swan brothers arrived in 1836; Many Irish Catholics settled in the township after 1828
		Sunnidale: Figured prominently in the War of 1812 (the *HMS Nancy* was sunk by the Americans in 1814); Fort Nottawasaga (Schoonertown) founded in 1815 but closed in 1818; Traversed by an Indigenous portage route that was used by the British from 1815 to ca. 1830; Surveyed by Thomas Kelly in 1831/32, save for a portion in the southeast; William Hawkins conducted the Sunnidale Road Survey in 1833 and laid out town plots at Rippon and Hythe
Township Development	Mid-19th to early 20th century	Flos: Population was only 200 in 1842; 2,326 ha taken up by 1846, with 277 ha under cultivation; Traversed by the North Simcoe Railway (1878); Prominent communities at Anten Mills, Craighurst, Apto, Phelpston, Crossland, Vigo, Saupin, Waverly, Van Vlack and Allenwood
		Sunnidale: Population was only 174 in 1842; Growth was stagnant due to combination of sandy soils and lack of roads, mills and markets; 1,272 ha taken up by 1846, with 153 ha under cultivation; 1 saw mill in operation at that time; Logging industry boomed throughout 19th century; Traversed by the Ontario, Simcoe & Huron/Northern Railway (1855); Prominent communities at Wasaga Beach, Sunnidale Corners, Sunnidale Village, New Lowell and Brentwood

1.2.2 Past and Present Land Use

1.2.2.1 Overview

During the Paleo period (ca. 12,000 BP), the general area would have been submerged under proglacial Lake Algonquin. Shorelines would have been subsequently submerged with the onset of the Nipissing Transgression ca. 7,500 BP, which formed the sand spit seen today across Nottawasaga Bay. After the lake's retreat the vicinity of the study area would have comprised a mixture of coniferous and deciduous trees, beaches, sand dunes, a lagoon (present Jack Lake), wetlands and open areas. Indigenous communities would have managed the landscape to some degree. During the early 19th century, Euro-Canadian settlers arrived in the area and began to clear the forests for settlement purposes and lumbering. The study area was located within the historic limits of the community of Wasaga Beach. The land use at the time of assessment can be classified as a mixture of transportation infrastructure (roadways, sidewalks, parking lot) and natural areas (grassed, treed and beach).

1.2.2.2 Wasaga Beach

Prior to its development as a community, the area of Wasaga Beach was an important hub for the fur trade industry and the movement of supplies. Three commissary stores and a fur trade outpost were established in 1815, the latter by the North-West Company, near the embouchure of the Nottawasaga River with the Nottawasaga Bay. The North-West Company employed the Nancy, a schooner, to conduct fur trading along the Great Lakes (Pelshea 1973:12–13). The Nancy was commissioned by the British Navy during the War of 1812 to serve as a supply vessel. In 1814, the schooner was sunk by the Americans while it was anchored in the Nottawasaga River.

Settlement to the area was slow after the War of 1812 and many of the first settlers were former military officers. The sandy soils were seen as unattractive to potential settlers, especially farmers. Rather, settlers were drawn to the area of Wasaga Beach for its dense forest and abundance of water sources, which were sought after for lumbering and small-scale fisheries. The Nottawasaga River served as a natural route for timbers to be transported to lumber mills upriver and across the bay. In 1870, John Van Vlack purchased 28 ha near the Nottawasaga River in the northwestern corner of the Township of Flos. He fished commercially and built a sawmill as well as operated a general store and served as the area's first postmaster. A small village known as Van Vlack, populated by mill workers and other settlers, grew up around his property. By the end of the 1880s, the beach area around the Van Vlack settlement became known as Wasaga Beach, a derivative of 'Nottawasaga'. By the turn of the 20th century, this area had a hotel and a few cottages, and it became a favoured locale for picnics and vacations. The first cottage lots in the area were surveyed in 1907, and Wasaga Beach developed into a cottage community during the 1920s. This growth accelerated with the advent of the automobile, as the beach became one of the most popular resort destinations in Ontario (Watson 2009:2–4).

1.2.2.3 Mapping and Imagery Analysis

In order to gain a general understanding of the study area's past land uses, three historic settlement maps, one topographic map and one aerial image were examined during the research component of the study. Specifically, the following resources were consulted:

- J. Hogg's *Hogg's Map of the County of Simcoe* (1871) (OHCMP 2019);
- The *Map of Flos* and the *Map of Sunnidale* from H. Belden & Co.'s *Illustrated Atlas of the Dominion of Canada: Simcoe Supplement* (1881) (McGill University 2001);
- A topographic map from 1945 (OCUL 2019); and
- An aerial image from 1954 (University of Toronto 2020).

The limits of the study area are shown on georeferenced versions of the consulted historical resources in Map 2–Map 6.

J. Hogg's *Map of the County of Simcoe* (1871) does not depict any landowners or structures within the study area, nor does it provide any additional settlement information (Map 2). The township boundary is clearly visible and the Nottawasaga River traverses centrally through the study area parallel to the Nottawasaga Bay shoreline. Similarly, the *Map of Flos Township* and the *Map of Sunnidale Township* from H. Belden & Co.'s *Illustrated Atlas of the Dominion of Canada: Simcoe Supplement* (1881) do not identify any landowners in the area (Map 3–Map 4). The lack of identified landowners does not necessarily mean that the area was unoccupied, however, as typically only subscribers to the *Illustrated Atlas* would be included in the published content. It is therefore possible that the residents of these lots were simply not subscribers and were accordingly omitted. Two structures are depicted north of the study area within Lot 26, Concession 9: the Van Vlack post office and a sawmill. No surveyed thoroughfares are illustrated in Sunnidale, while two are depicted in Flos (including a schematic rendering of River Road East). However, several unopened road allowances are indicated within both townships.

The topographic map from 1945 indicates that the portion of the study area west of the Nottawasaga River was well-settled, with structures depicted flanking Mosley Street and the intersecting side streets (Map 5). The portion east of the Nottawasaga River was less developed at this time, with River Road East and Beck Street indicated in their current alignments. The surrounding natural landscape is shown as densely forested, with both coniferous and deciduous trees represented. Contour lines indicate the vicinity of the study area is gently sloped down towards Nottawasaga Bay.

The aerial image from 1954 shows the environs of the study area as a mixture of undeveloped natural lands and residential (Map 6). The road alignments as shown on the 1945 topographic map remain the same, as do the banks of the Nottawasaga River and the shoreline of the bay. Residential properties continue to be clustered along either side of the Nottawasaga River, the majority in close proximity to the beach. At this time, Wasaga Beach was still a cottage/recreational destination and development of residential subdivisions and a downtown had not yet begun. No structures appear within the study area, all of which were set back from the road allowance, but several driveways do traverse the project lands.

The western portion of the study area abuts portions of the Wasaga Beach Provincial Park, including 'The Point' beach area to the northeast and 'The Forum' area to the southwest. Wasaga Beach Provincial Park was established in 1959 and includes a dunes area and eight beaches, six of which are accessed off Mosely Street.

1.3 Archaeological Context

The Stage 1 assessment (property inspection) was conducted on November 6, 2019 under PIF #P007-1068-2019. The limits of the study area were confirmed using georeferenced aerial imagery showing artificial and natural formations in relation to the project lands.

The archaeological context of any given study area must be informed by 1) the condition of the property as found (Section 1.3.1), 2) a summary of registered or known archaeological sites located within a minimum 1 km radius (Section 1.3.2) and 3) descriptions of previous archaeological fieldwork carried out within the limits of, or immediately adjacent to the subject lands (Section 1.3.3).

1.3.1 Condition of the Property

The study area lies within the Great Lakes–St. Lawrence forest region, which is a transitional zone between the southern deciduous forest and the northern boreal forest. This forest extends along the St. Lawrence River across central Ontario to Lake Huron and west of Lake Superior along the border with Minnesota, and its southern portion extends into the more populated areas of Ontario. This forest is dominated by hardwoods, featuring species such as maple, oak, yellow birch, white and red pine. Coniferous trees such as white pine, red pine, hemlock and white cedar commonly mix with deciduous broad-leaved species, such as yellow birch, sugar and red maples, basswood and red oak (MNRF 2020).

In terms of local physiography, the study area lies within the region known as the Simcoe Lowlands, which consists of an approximately 284,899 ha area bordering Georgian Bay and Lake Simcoe. Specifically, the study area lies within the western part of the region (the Nottawasaga basin), which was once flooded by glacial Lake Algonquin and is bordered by shorecliffs, beaches and bouldery terraces. The Nottawasaga basin is limited to the broad flats bordering the river, and its surface beds comprise deposits of deltaic and lacustrine origin rather than glacial outwash (Chapman and Putnam 1984:177–180).

According to the Ontario Soil Survey, two soil types occur within the study area and are distinctly separated by the Nottawasaga River. Eastport sand occurs in the western portion of the study area, while Tioga loamy sand occurs to the east. Eastport sand is part of the dry sands great soil group, having developed on grey calcareous outwash sand and characterized by excessive drainage. Tioga loamy sand is a podzol soil developed on grey calcareous outwash sand and characterized by good drainage (Hoffman et al. 1962:Soil Map North Sheet).

The subject lands fall within the Lower Nottawasaga River Reach drainage basin, which is under the jurisdiction of the Nottawasaga Valley Conservation Authority (NVCA 2019). Specifically, the study area is traversed by the Nottawasaga River, is 3 m east of Georgian Bay, 14 m south of a tributary of the Nottawasaga River and 70 m west of the Wasaga Beach wetland.

At the time of assessment, the study area comprised an assortment of roadway platforms, shoulders, ditches and sidewalks associated with Main Street, Mosley Street, Beach Drive, Stonebridge Boulevard, Wood Avenue, Elm Drive, Beck Street, Glenwood Drive, River Avenue Crescent, River Road East, Jenetta Street, Spruce Street, Willow Street, 1st Street, 2nd Street and

3rd Street, as well as adjacent driveways, maintained lawns, treed areas and portions of sandy beach. Field conditions were ideal during the assessment, with high ground surface visibility. No unusual physical features were encountered that affected the results of the Stage 1 assessment.

1.3.2 Registered or Known Archaeological Sites

The Ontario Archaeological Sites Database and the Ontario Public Register of Archaeological Reports were consulted to determine whether any registered or known archaeological resources occur within a 1 km radius of the study area. The available search facility returned a total of six registered archaeological sites located within at least a 1 km radius (the facility returns sites in a rectangular area, rather than a radius, potentially resulting in returns located beyond the specified distance). In terms of other known resources (e.g., Isolated Non-Diagnostic Find Spots, Leads or unreported deposits), five unregistered sites were identified within a 1 km radius. The sites are summarized in Table 3.

Table 3: Registered or Known Archaeological Sites

Borden No. / Identifier	Site Name	Time Period	Affinity	Site Type	Distance from Study Area
BdHa-1	Van Vlack	Pre-Contact	Indigenous	Unknown	50 m–300 m
BdHa-2	Second Street Burial	Pre-Contact	Indigenous	Burial	Within
BdHa-3	H.M.S. Nancy	Post-Contact	British	Shipwreck	50 m–300 m
BdHa-4	Sandpiper	Pre-Contact Post-Contact	Indigenous Euro-Canadian	Unknown	< 50 m
BdHa-5	Bayou Campground	Unknown	Unknown	Burial	> 1 km
BdGx-4	Marl Lake	Late Woodland Post-Contact	Indigenous	Unknown	> 1 km
Unregistered	Bunkhouse	Post-Contact	British	Lodging	50 m–300 m
Unregistered	Blockhouse	Post-Contact	British	Unknown	50 m–300 m
Unregistered	Commissary Stores	Post-Contact	British	Store	300 m–1 km
Unregistered	HV	Pre-Contact	Indigenous	Unknown	50 m–300 m
Unregistered	North-West Company Post	Post-Contact	Canadian	Fur trade post	300 m–1 km

The Second Street site (BdHa-2) is located within the western portion of the study area. As a relevant archaeological resource that could impact fieldwork strategy decisions and recommendations, it is fully discussed in Section 1.3.3. The Sandpiper site (BdHa-4) is reportedly located within 50 m, while the Van Vlack site (BdHa-1), H.M.S. Nancy site (BdHa-3) and three unregistered sites are located within 300 m of the study area. These sites must also be considered as relevant features of archaeological potential. The remaining sites represent more distant archaeological resources.

1.3.3 Previous Archaeological Work

A review of available archaeological management plans and/or other archaeological potential mapping was undertaken to inform the assessment process. Specifically, Simcoe County's *Archaeological Potential* GIS Layer (2020) was examined for information that could influence the choice of fieldwork techniques or recommendations. The associated mapping indicates that the majority of the study area falls within the no integrity area assigned to most paved roadway

corridors, and only the intersection of Mosley Street and 2nd Street and lands adjacent to the roadways are identified as having archaeological potential (Map 7).

Reports documenting assessments conducted within the subject lands and assessments that resulted in the discovery of sites within adjacent lands were sought during the research component of the study. In order to ensure that all relevant past work was identified, an investigation was launched to identify reports involving assessments within 50 m of the study area. The investigation determined that there are two available reports documenting previous archaeological fieldwork within the specified distance. Additionally, two general archaeological surveys conducted in the early 1970s were identified. The relevant results and recommendations are summarized below as required by Section 7.5.8 Standards 4–5 of the 2011 *S&Gs*.

The associated report documenting the Sandpiper site (BdHa-4) could not be obtained. The site record form indicates the site was a campsite located beneath cottages on River Road West. However, GPS coordinates indicate the site was located on River Road East, a likely transcription error. The site is mentioned in the Conway survey as being destroyed, and therefore does not represent an archaeological concern for the project.

1.3.3.1 Wasaga Beach Provincial Park Archaeological Inventory

Between 1972 and 1973, Victor Pelshea was contracted by the Ministry of Natural Resources to conduct an archaeological inventory for the proposed Wasaga Beach Provincial Park, the scope of which included documenting the general Pre-Contact history of the park and surrounding area and compiling an inventory of archaeological sites of the Wasaga Beach area (Pelshea 1973). An archaeological survey of the proposed park was recommended, as well as the salvage excavation of the Schoonertown site (Fort Nottawasaga) prior to bridge construction (Pelshea 1973:17–19). Of interest is the documentation of two sites relevant to the subject study area, including the Second Street site (BdHa-2) and the H.M.S. Nancy site (BdHa-3). A summary of both of these sites is provided below.

The Second Street Burial site (BdHa-2) was observed by Shropshire in 1969 and formally recorded in 1973. As noted above, the site is within the subject study area (SD Map 1). No formal investigation or report was made at the time of observation. The burial consisted of a skull and ‘other bones’ uncovered during construction activities. The County pathologists report from this time stated the skull appeared to belong to an Indigenous adult male, 20–30 years of age. The burial was reportedly located on the north bank of the Nottawasaga River, southwest of Nancy Island and on an extension of Second Street, though the precise location remains unknown. The site record form for BdHa-2 does not provide any additional information.

The H.M.S. Nancy site (BdHa-3) represents the schooner built in 1789 and sunk in 1814. The site is southeast of the subject study area (SD Map 1). The shipwreck was rediscovered by C. Snider in 1925 and raised in 1928. The build up of silt and sand around the sunken hull formed a small island, Nancy Island, and the site is currently a registered National Historic Site. Artifacts recovered included cannonballs, charred timbers and flintlock muskets amongst various other cargo.

1.3.3.2 Wasaga Beach Provincial Park Archaeological Survey

The archaeological survey for the proposed Wasaga Beach Provincial Park were conducted between September and October 1973 (Conway 1973). The survey included systematic testing of geomorphological features, visual examination of eroded areas, the study of aerial images and the appraisal of information obtained from park staff, local residents and interested archaeologists. Several areas of disturbance were noted, including landscaping to remove the sand dunes in the lower spit area, cottage development, cottage demolition and road construction. Only six areas of the park land were subject to testing: 1) between the embouchure of the Nottawasaga River with the Bay and the Main Street bridge, 2) between 3rd and 12th Streets and Mosley and Forest Streets, 3) between Bay Street and 12th Avenue, 4) a small section of ancient beach line along Powerline Road, 5) a portion of land extending south from River Road West and 6) a dune area east of one of the oxbow's of Nottawasaga River. Testing of these areas resulted in the recovery of eight areas of archaeological resources associated with the unregistered Euro-Canadian Bunkhouse site, BcHa-19, BcHa-20, BcHa-23, BcHa-26, BcHa-31, BcHa-32 and BcHa-33. Site visits were also conducted for previously registered archaeological sites in the area.

The remainder of the text includes the faunal report and various appendices associated with the Stage 4 salvage excavation of the Schoonertown site (BcHa-18), a history of the Lower Nottawasaga River and a brief description of archaeological sites in the area with their status at the time. The Second Street Burial site is noted as having been destroyed, likely a result of the construction activities that led to its discovery (Conway 1973:Table 2). This site therefore does not represent an archaeological concern for the project.

1.3.3.3 River Road West Urbanization (Stage 1)

A Stage 1 assessment was carried out for the proposed River Road West Urbanization project from Billinger Drive to the eastern town limits in July 2009 under PIF #P007-200-2009 (ARA 2009). The assessed area traverses the eastern part of the subject lands. The Stage 1 assessment determined that the study area comprised a mixture of areas of archaeological potential and areas of no archaeological potential. It was recommended that a Stage 2 assessment be conducted for all areas of archaeological potential that may be impacted by the project (ARA 2009:18). In the vicinity of the subject lands, test pit survey was not recommended as the abutting lands were disturbed (ARA 2009:30–31). The overlapping area of previous assessment is therefore of no further archaeological concern.

1.3.3.4 Proposed Bridge Locations Across the Nottawasaga River (Stage 1)

A Stage 1 assessment was carried out for the proposed new bridge across the Nottawasaga River in July 2012 under PIF #P334-227-2012 (AW 2014). The Stage 1 assessment was conducted for four proposed bridge locations: Crossing A–D. The Crossing D location traverses the southwestern portion of the subject lands at the intersection of Mosley Street and 2nd Street. The Stage 1 assessment determined that the study area comprised a mixture of areas of archaeological potential and areas of no archaeological potential. It was recommended that a Stage 2 assessment be conducted for the areas of archaeological potential within the preferred bridge crossing option (AW 2014:14). In the vicinity of the subject lands, the majority of the area was determined to be disturbed, save for a small grassed portion on the north side of 2nd Street which was recommended

for test pit survey (AW 2017:Map 6). Portions of the overlapping area of previous assessment are therefore of no further archaeological concern.

2.0 STAGE 1 BACKGROUND STUDY

2.1 Background

The Stage 1 assessment involved background research to document the geography, history, previous archaeological fieldwork and current land condition of the study area. This desktop examination included research from archival sources, archaeological publications and online databases. It also included the analysis of a variety of historic maps and aerial images. The results of the research conducted for the background study are summarized below.

With occupation beginning approximately 11,000 years ago, the greater vicinity of the study area comprises a complex chronology of Pre-Contact and Post-Contact histories (Section 1.2). Artifacts associated with Palaeo, Archaic, Woodland and Early Contact traditions are well-attested in Simcoe County, and Euro-Canadian archaeological sites dating to pre-1900 and post-1900 contexts are likewise common. The presence of 11 previously identified archaeological sites in the surrounding area demonstrates the desirability of this locality for early settlement (Section 1.3.2). The Second Street site (BdHa-2) was reportedly located within the subject lands; however, the site is no longer present, having been documented as destroyed in the late 1970s. Background research identified two areas of previous assessment within the study area (Section 1.3.3).

The natural environment of the study area would have been attractive to both Indigenous and Euro-Canadian populations as a result of proximity to the Nottawasaga River, its tributaries and Nottawasaga Bay. The sandy soils would not have been favourable for agriculture, though the dense forest would have attracted logging to the area and the diverse local vegetation would have encouraged settlement throughout Ontario's lengthy history. Euro-Canadian populations would have been particularly drawn to River Road East as it was a historically-surveyed thoroughfare, as well as the early community of Wasaga Beach.

In summary, the background study included an up-to-date listing of sites from the Ontario Archaeological Sites Database (within at least a 1 km radius), the consideration of previous local archaeological fieldwork (within at least a 50 m radius), the analysis of historic maps (at the most detailed scale available) and the study of aerial imagery. A review of an archaeological management plan was also carried out. ARA therefore confirms that the standards for background research set out in Section 1.1 of the 2011 *S&Gs* were met.

2.2 Field Methods (Property Inspection)

In order to gain first-hand knowledge of the geography, topography and current condition of the study area, a property inspection was conducted on November 6, 2019. Environmental conditions were ideal during the inspection, with partly cloudy skies, a high of 2 °C and excellent lighting. ARA therefore confirms that fieldwork was carried out under weather and lighting conditions that met the requirements set out in Section 1.2 Standard 2 of the 2011 *S&Gs*.

The study area was subjected to a systematic visual inspection in accordance with the requirements set out in Section 1.2 of the 2011 *S&Gs*. Specifically, the inspection began in the southwestern part of the study area at the intersection of Mosley Street and 6th Street and progressed northeast along Mosely Street with deviations to inspect the relevant cross-streets. The inspection then crossed

over the Main Street bridge and proceeded in a similar fashion until the intersection of Main Street with River Road West. The inspection confirmed that all surficial features of archaeological potential (e.g., historic roadways) were present where they were previously identified and did not result in the identification of any additional features of archaeological potential not visible on mapping (e.g., relic water channels, patches of well-drained soils, etc.).

The inspection determined that parts of the study area were disturbed by past construction activities. Several permanently wet areas were also encountered and documented during the assessment. No other natural features (e.g., sloped lands, overgrown vegetation, heavier soils than expected, etc.) or significant built features (e.g., heritage structures, landscapes, plaques, monuments, cemeteries, etc.) that would affect assessment strategies were identified.

2.3 Analysis and Conclusions

In addition to relevant historical sources and the results of past archaeological assessments, the archaeological potential of a property can be assessed using its soils, hydrology and landforms as considerations. Section 1.3.1 of the 2011 *S&Gs* recognizes the following features or characteristics as indicators of archaeological potential: previously identified sites, water sources (past and present), elevated topography, pockets of well-drained sandy soil, distinctive land formations, resource areas, areas of Euro-Canadian settlement, early transportation routes, listed or designated properties, historic landmarks or sites, and areas that local histories or informants have identified with possible sites, events, activities or occupations.

The Stage 1 assessment resulted in the identification of several features of archaeological potential in the vicinity of the study area (Map 8, SD Map 1). The closest and most relevant indicators of archaeological potential (i.e., those that would directly affect survey interval requirements) include seven archaeological sites (BdHa-1, BdHa-2, BdHa-3, BdHa-4, Blockhouse, Bunkhouse and HV), multiple primary water sources (Nottawasaga Bay, the Nottawasaga River and its tributaries), five secondary water sources (portions of the Wasaga Beach wetland and an unnamed wetland), one historic roadway (River Road East) and two historic structure localities (19th-century steam sawmill and post office). Background research did not identify any features indicating that the study area has potential for deeply buried archaeological resources.

Although proximity to a feature of archaeological potential is a significant factor in the potential modelling process, current land conditions must also be considered. Section 1.3.2 of the 2011 *S&Gs* emphasizes that 1) quarrying, 2) major landscaping involving grading below topsoil, 3) building footprints and 4) sewage/infrastructure development can result in the removal of archaeological potential, and Section 2.1 states that 1) permanently wet areas, 2) exposed bedrock and 3) steep slopes (> 20°) can also be considered as having no archaeological potential. Areas previously assessed and not recommended for further work also require no further assessment.

Simcoe County's *Archaeological Potential* GIS Layer (2020) indicates that the majority of the study area falls within the no integrity area assigned to most paved roadway corridors, and only the intersection of Mosley Street and 2nd Street and lands adjacent to the roadways are identified as having archaeological potential (Map 7). However, this modelling was not the result of a property-specific assessment and therefore does not fully account for land-use history and current conditions. Two previously assessed areas were identified within the project lands, one which was

determined to be disturbed and one which recommended further assessment to confirm the presence/absence of disturbance.

ARA's visual inspection, coupled with the analysis of historical sources and digital environmental data, resulted in the identification of multiple areas of no archaeological potential within the study area. Specifically, deep land alterations have resulted in the removal of archaeological potential from the municipal parking lots, Main Street Market, roadway platforms, shoulders and ditches associated with Main Street, Mosley Street, Beach Drive, Stonebridge Boulevard, Wood Avenue, Elm Drive, Beck Street, Glenwood Drive, River Avenue Crescent, River Road East, Jenetta Street, Spruce Street, Willow Street, 1st Street, 2nd Street and 3rd Street and associated sidewalks and intersections (Image 1–Image 10). These areas had clearly been impacted by past earth-moving/construction activities (e.g., general grading below topsoil, underground services installation and major landscaping), resulting in the disturbance of the original soils to a significant depth and severe damage to the integrity of any archaeological resources. Four permanently wet areas were also identified (Image 11–Image 12), and two areas of previously assessed lands were photo-documented (Image 13–Image 14). The remainder of the study area has potential for Indigenous and Euro-Canadian archaeological materials or requires test pit survey to confirm the presence/extent of any subsurface disturbances. The areas of archaeological potential include grassed and treed areas and portions of the sandy beach along Beach Drive (Image 15–Image 24).

In summary, the Stage 1 assessment determined that the study area comprised a mixture of areas of archaeological potential, areas of no archaeological potential and previously assessed lands of no further concern. The potential modelling results are presented in Map 9–Map 19. The limits of the project lands ('study area') are depicted as a layer in these maps.

3.0 RECOMMENDATIONS

The Stage 1 assessment determined that the study area comprised a mixture of areas of archaeological potential, areas of no archaeological potential and previously assessed lands of no further concern. ARA recommends that all identified areas of archaeological potential that could be impacted by the project be subject to a Stage 2 property assessment in accordance with Section 2.1 of the 2011 *S&Gs*.

The grassed, treed and sandy beach areas along Beach Drive must be assessed using the test pit survey method. A survey interval of 5 m will be required due to the proximity of the lands to the identified features of archaeological potential. Given the likelihood that the soils along the edges of the roadways were impacted by past construction activities, a combination of visual inspection and test pit survey should be utilized to confirm the extents of any disturbed areas in accordance with Section 2.1.8 of the 2011 *S&G*s. This will allow for the empirical evaluation of the integrity of the soils and the depth of any past disturbances. If disturbance cannot be confirmed, then a test pit survey interval of 5 m must be maintained. Each test pit must be excavated into at least the first 5 cm of subsoil, and the resultant pits must be examined for stratigraphy, potential features and/or evidence of fill. The soil from each test pit must be screened through mesh with an aperture of no greater than 6 mm and examined for archaeological materials. If archaeological materials are encountered, all PTPs must be documented and intensification may be required.

The identified areas of no archaeological potential and previously assessed lands of no further concern do not require any additional assessment. Given that there are still outstanding archaeological concerns within the subject lands, no ground alterations or development of any kind may occur until the Stage 2 assessment is complete, a recommendation that the lands require no further archaeological assessment is made, and the associated report is entered into the Ontario Public Register of Archaeological Reports.

4.0 ADVICE ON COMPLIANCE WITH LEGISLATION

Section 7.5.9 of the 2011 *S&Gs* requires that the following information be provided for the benefit of the proponent and approval authority in the land use planning and development process:

- This report is submitted to the Minister of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the MHSTCI, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.
- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.
- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.
- The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar at the Ministry of Government and Consumer Services.

5.0 IMAGES

Image 1: Disturbed Lands
(November 6, 2019; Facing Northeast)

Image 2: Disturbed Lands
(November 6, 2019; Facing Southwest)

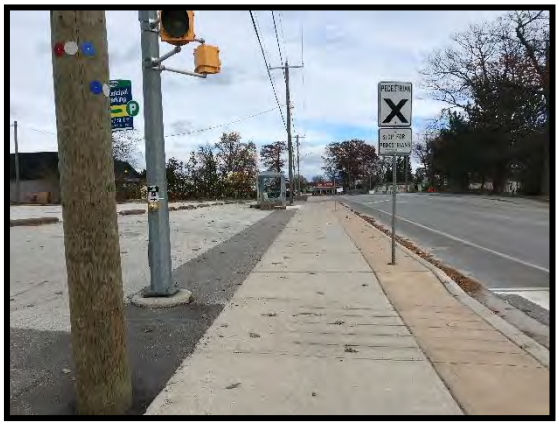

Image 3: Disturbed Lands
(November 6, 2019; Facing Northeast)

Image 4: Disturbed Lands
(November 6, 2019; Facing North)

Image 5: Disturbed Lands
(November 6, 2019; Facing Southwest)

Image 6: Disturbed Lands
(November 6, 2019; Facing Northeast)

Image 7: Disturbed Lands
(November 6, 2019; Facing Southeast)

Image 8: Disturbed Lands
(November 6, 2019; Facing Southwest)

Image 9: Disturbed Lands
(November 6, 2019; Facing West)

Image 10: Disturbed Lands
(November 6, 2019; Facing West)

Image 11: Permanently Wet Lands
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Image 12: Permanently Wet Lands
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Image 13: Previously Assessed Lands
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Image 14: Previously Assessed Lands
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Image 15: Area of Potential
(November 6, 2019; Facing Northwest)

Image 16: Area of Potential
(November 6, 2019; Facing Southeast)

Image 17: Area of Potential
(November 6, 2019; Facing Northwest)

Image 18: Area of Potential
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Image 19: Area of Potential
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Image 20: Area of Potential
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Image 21: Area of Potential
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Image 22: Area of Potential
(November 6, 2019; Facing Northwest)

Image 23: Area of Potential
(November 6, 2019; Facing Southeast)

Image 24: Area of Potential
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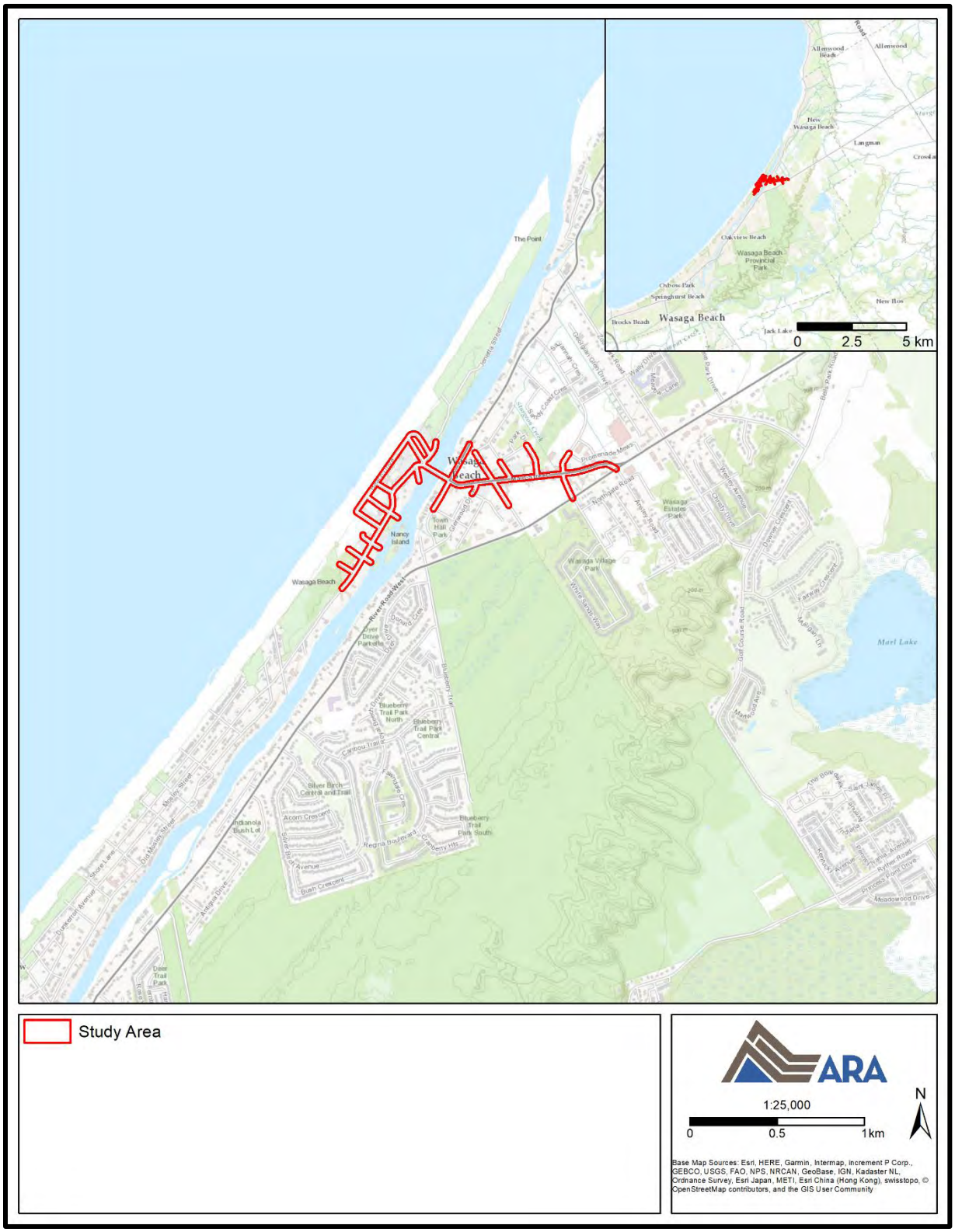
6.0 MAPS



Map 1: Location of the Study Area
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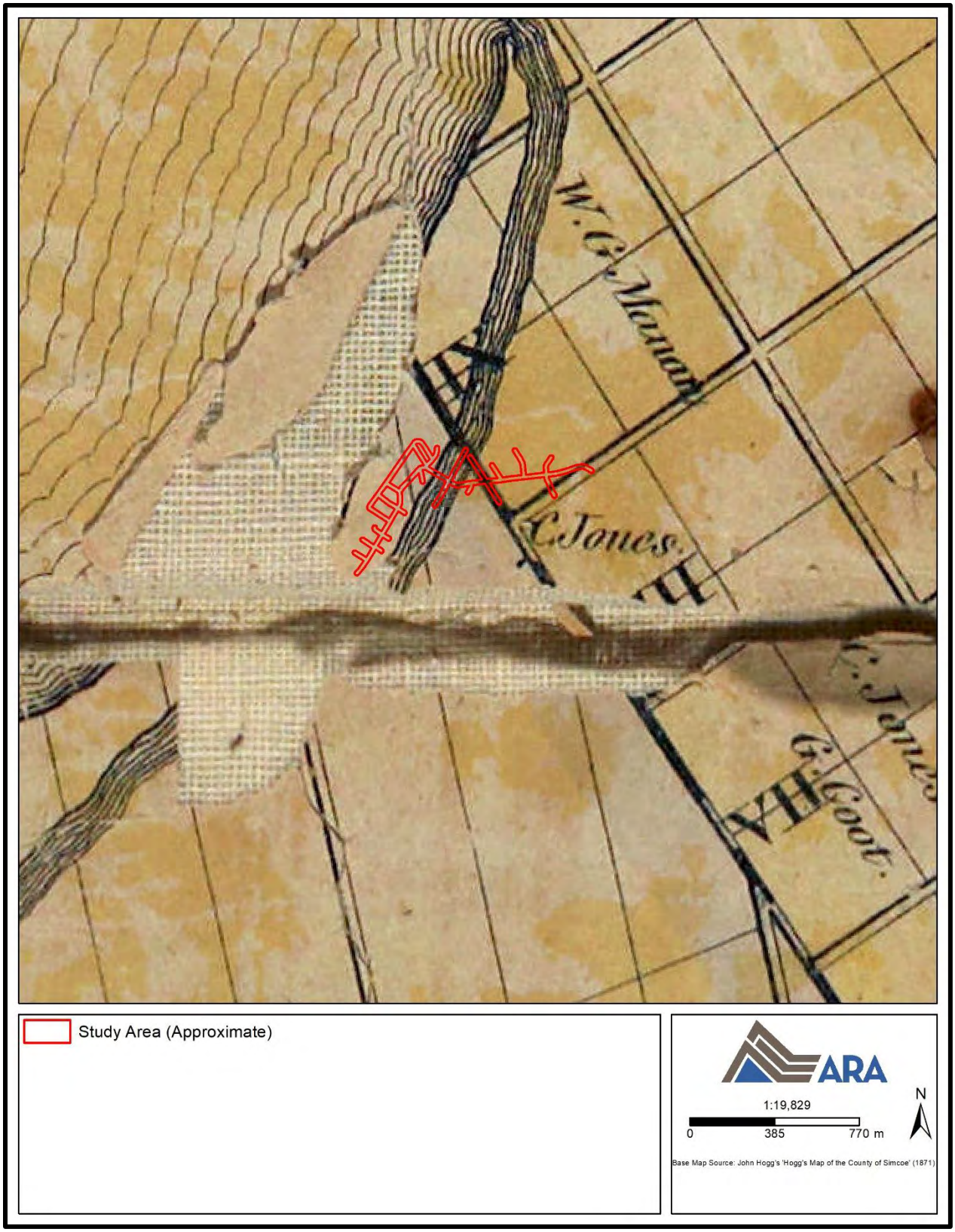
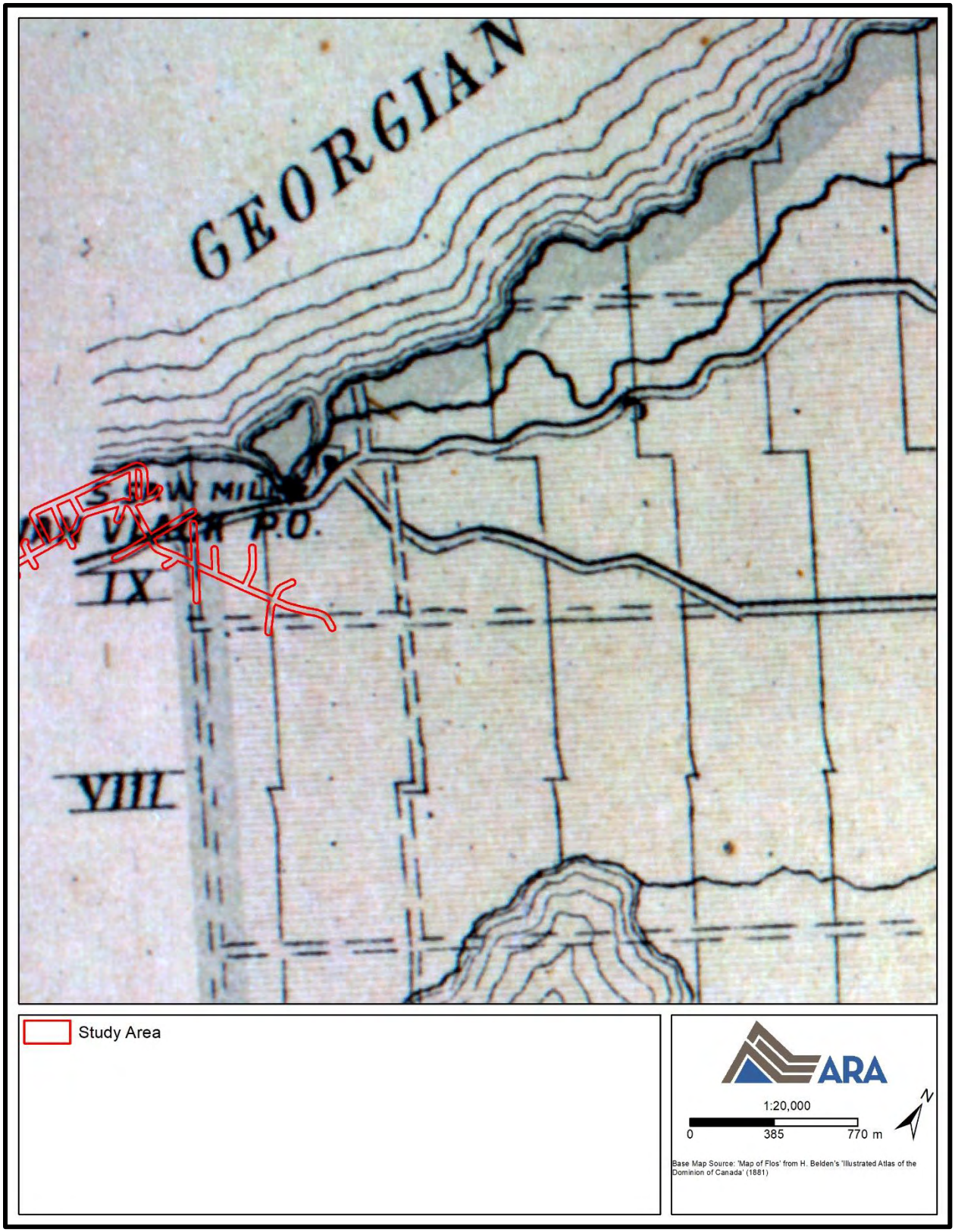
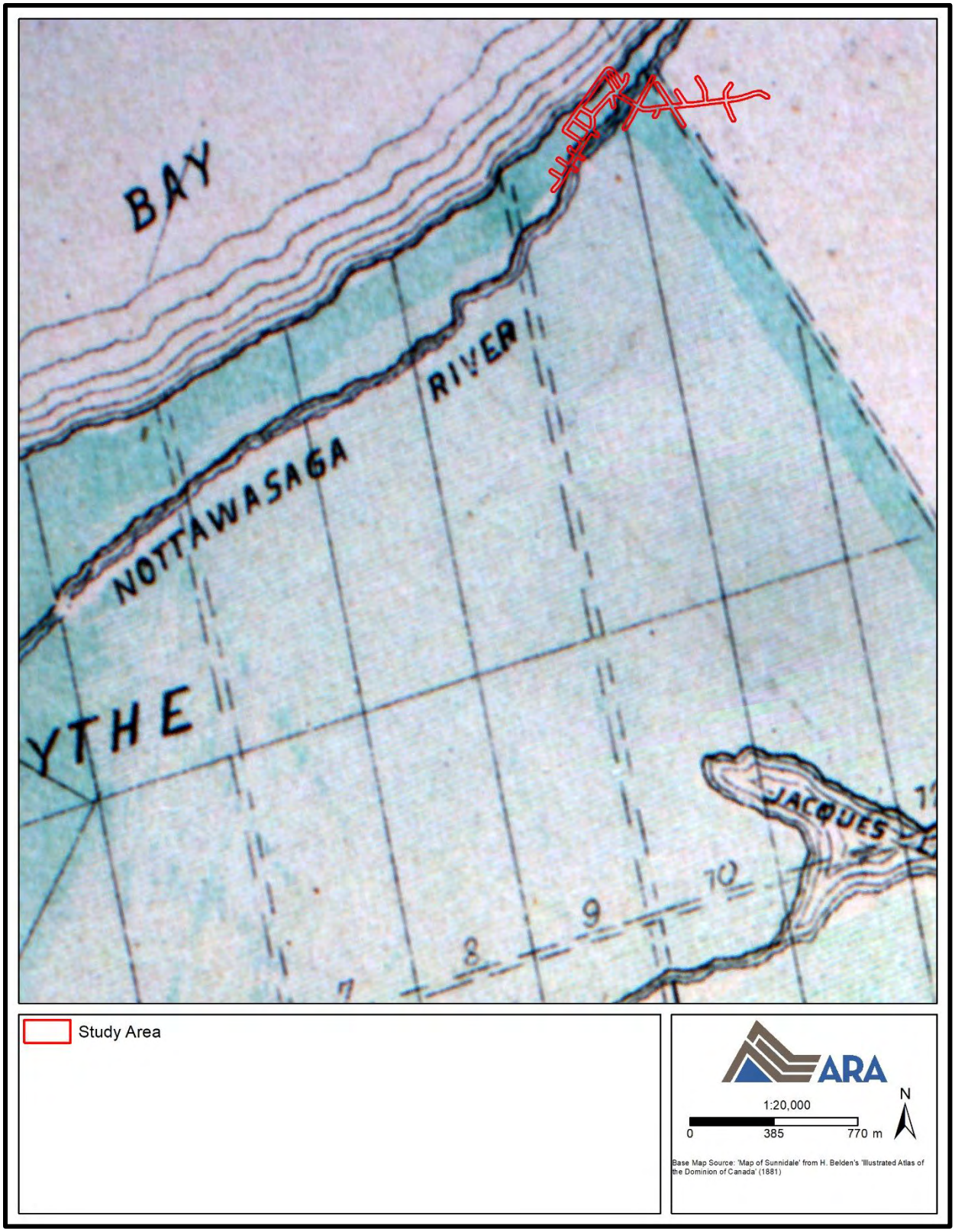


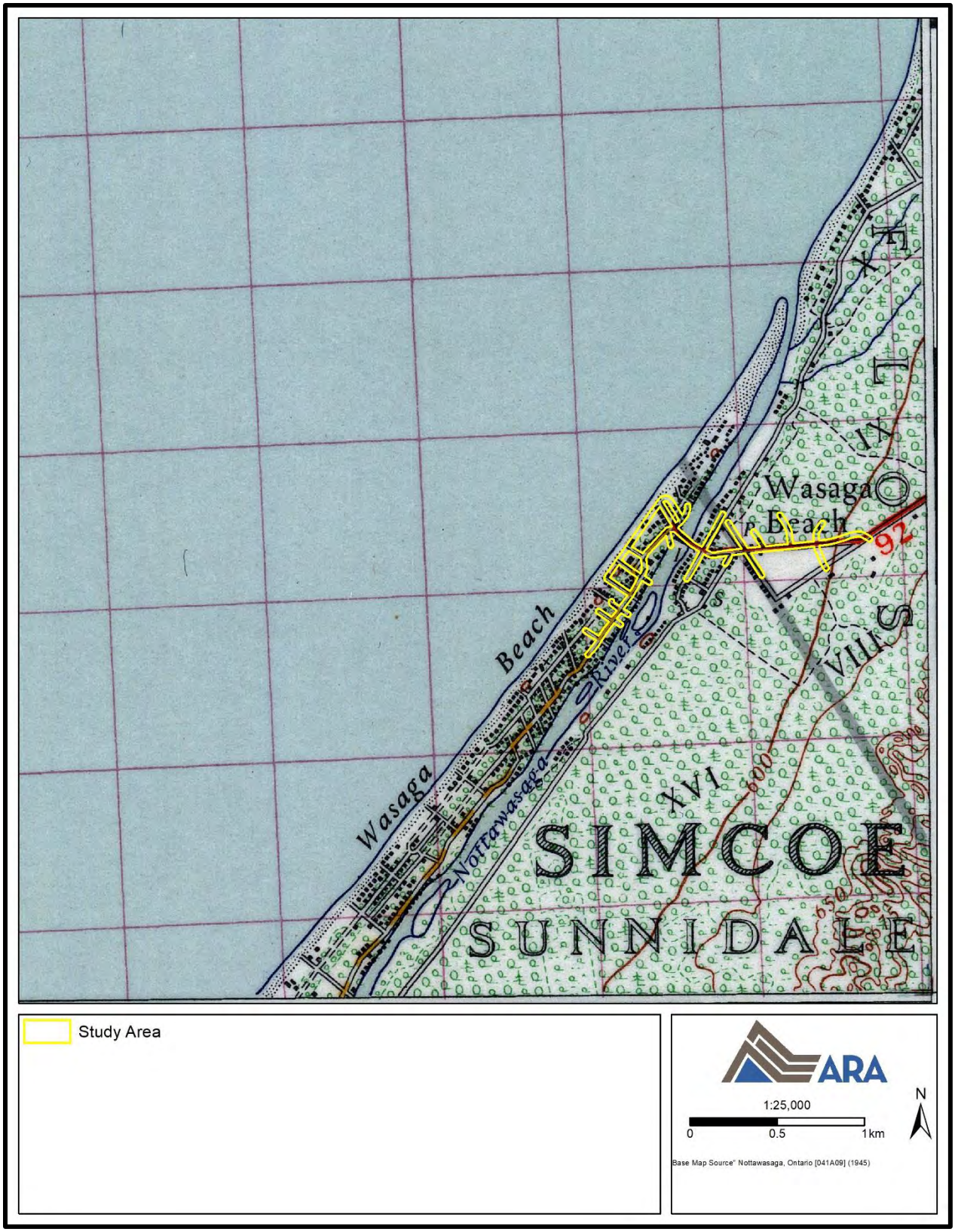
Map 2: J. Hogg's *Hogg's Map of the County of Simcoe* (1871)
(Produced under licence using ArcGIS® software by Esri, © Esri; OHCMP 2019)



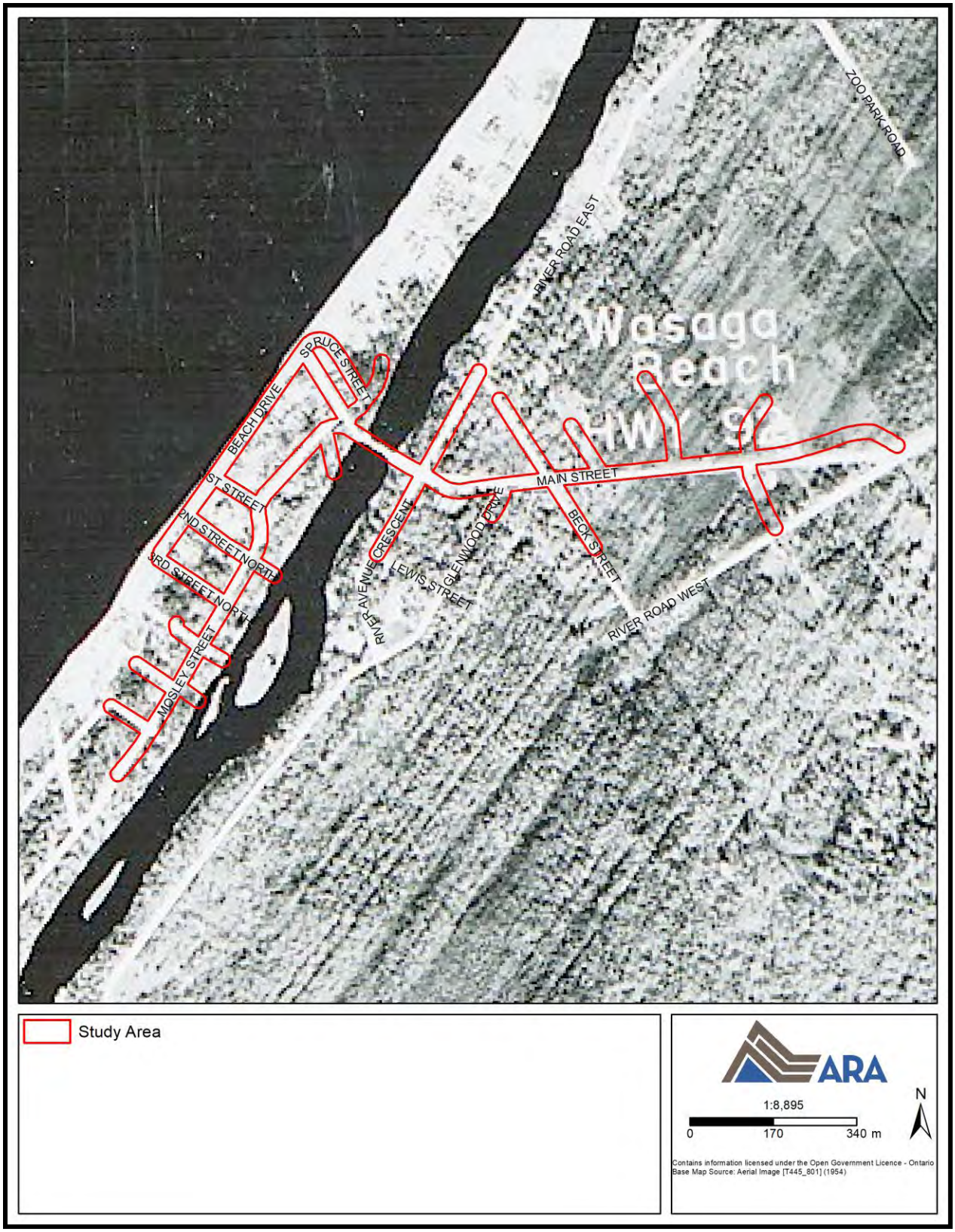
Map 3: *Flos* from H. Belden & Co.'s *Illustrated Atlas of the Dominion of Canada: Simcoe Supplement* (1881)
(Produced under licence using ArcGIS® software by Esri, © Esri; McGill University 2001)



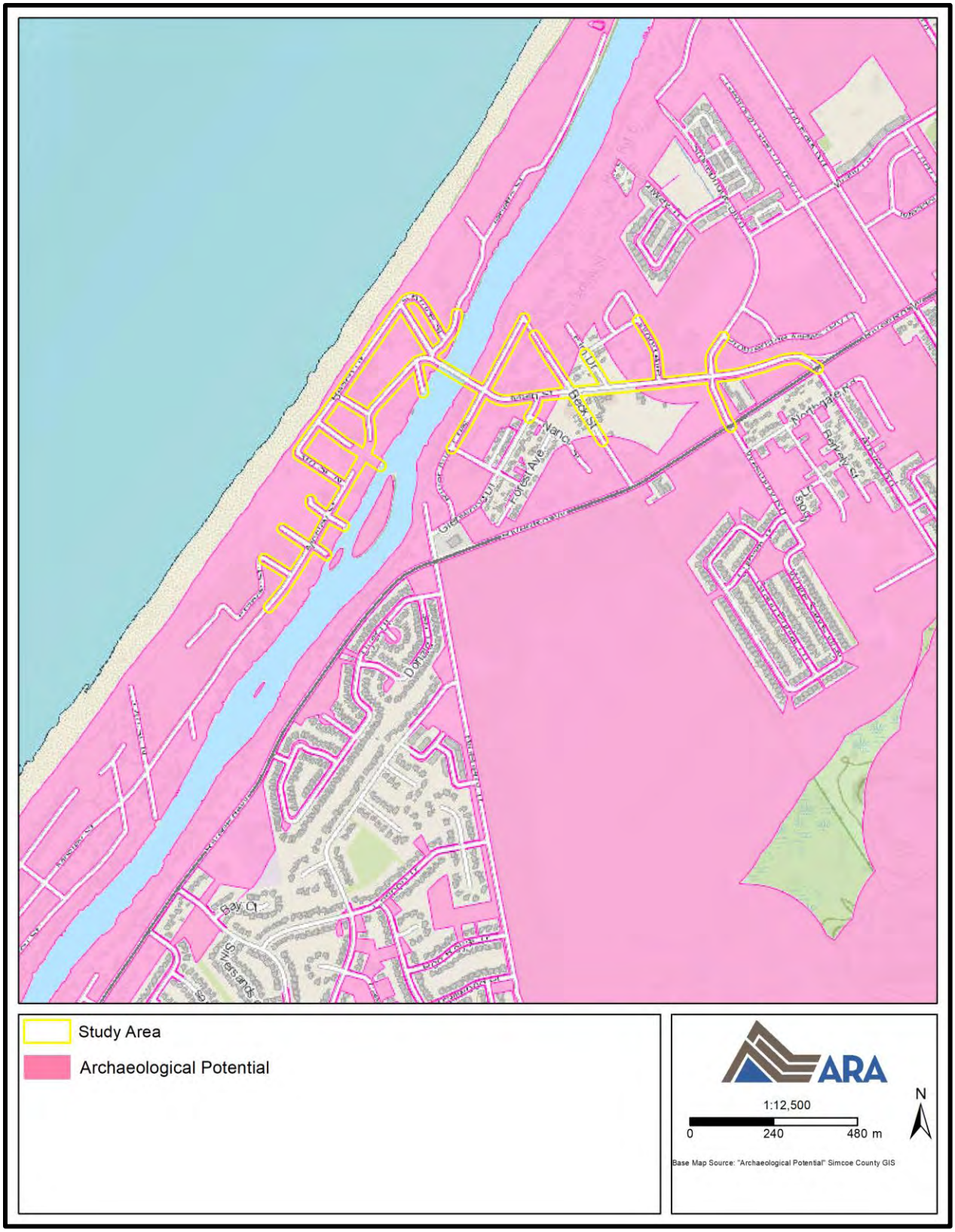
Map 4: *Sunnidale* from H. Belden & Co.'s *Illustrated Atlas of the Dominion of Canada: Simcoe Supplement* (1881)
(Produced under licence using ArcGIS® software by Esri, © Esri; McGill University 2001)



Map 5: Topographic Map (1945)
(Produced under licence using ArcGIS® software by Esri, © Esri; OCUL 2020)

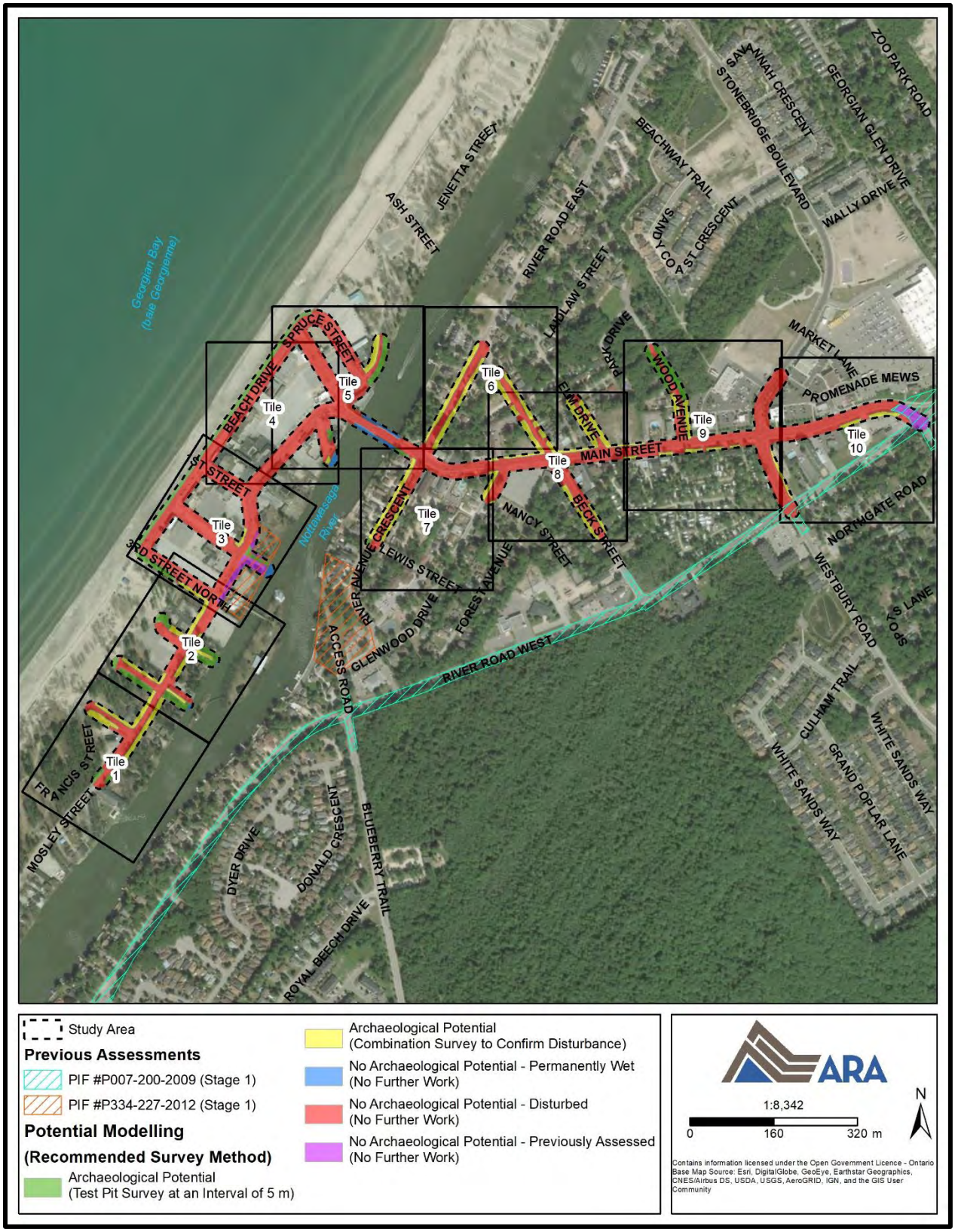


Map 6: Aerial Image (1954)
(Produced under licence using ArcGIS® software by Esri, © Esri; University of Toronto 2020)

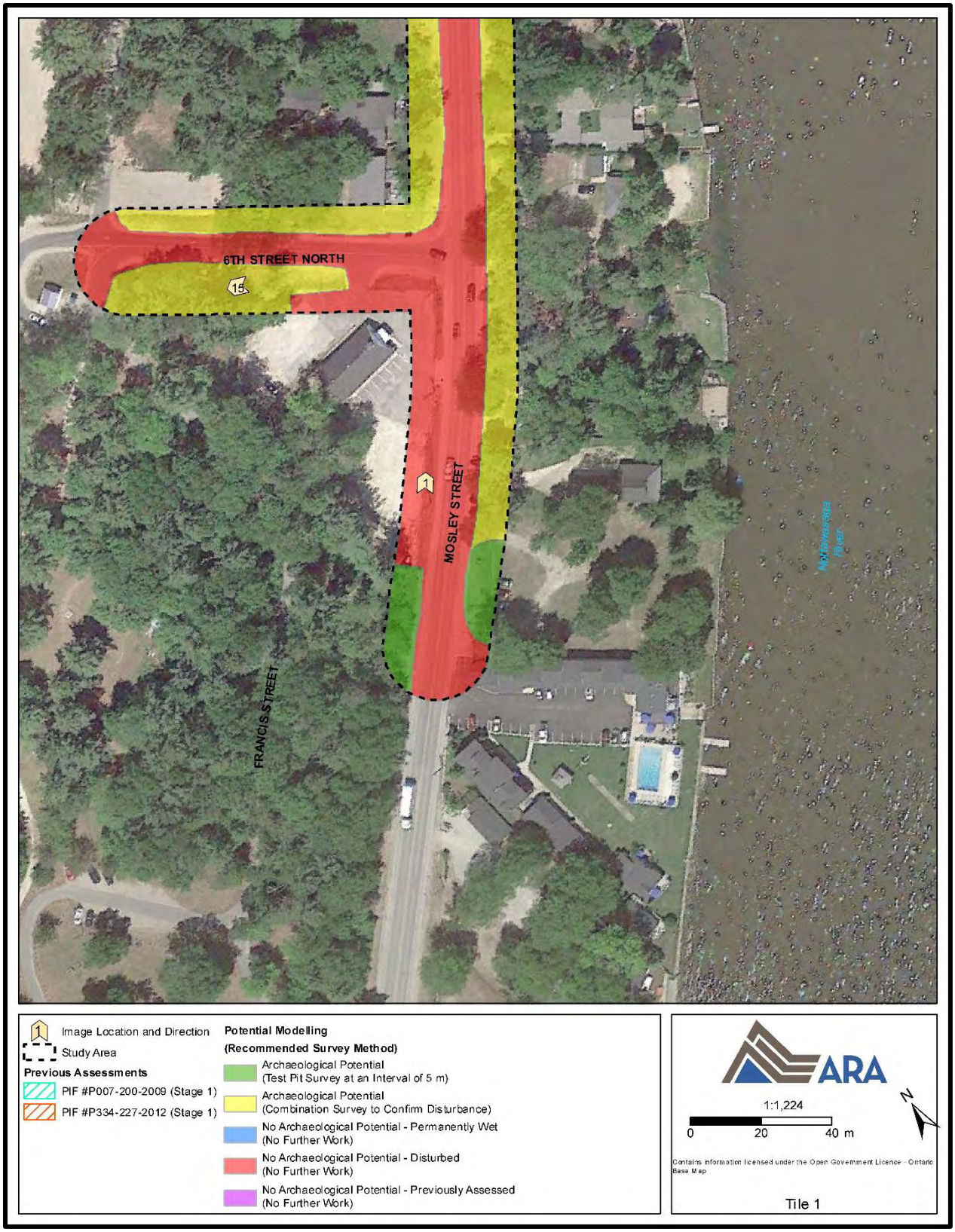


Map 7: Simcoe County's *Archaeological Potential* GIS Layer
(Produced under licence using ArcGIS® software by Esri, © Esri; Simcoe County 2020)

Map 8: Features of Potential
(Produced under licence using ArcGIS® software by Esri, © Esri)



Map 9: Potential Modelling and Recommendations – Overview
(Produced under licence using ArcGIS® software by Esri, © Esri)



Map 10: Potential Modelling and Recommendations – Tile 1
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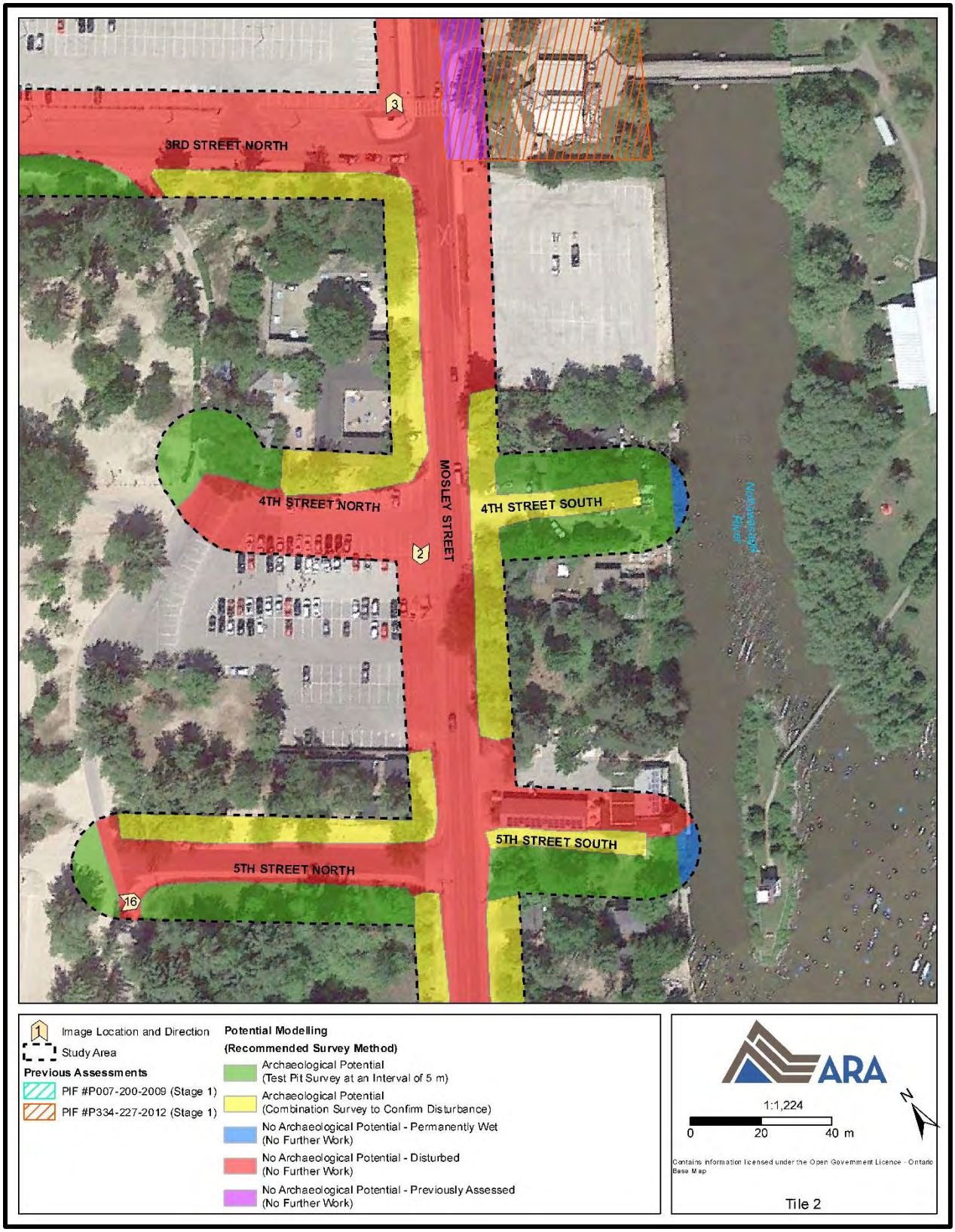

Map 11: Potential Modelling and Recommendations – Tile 2
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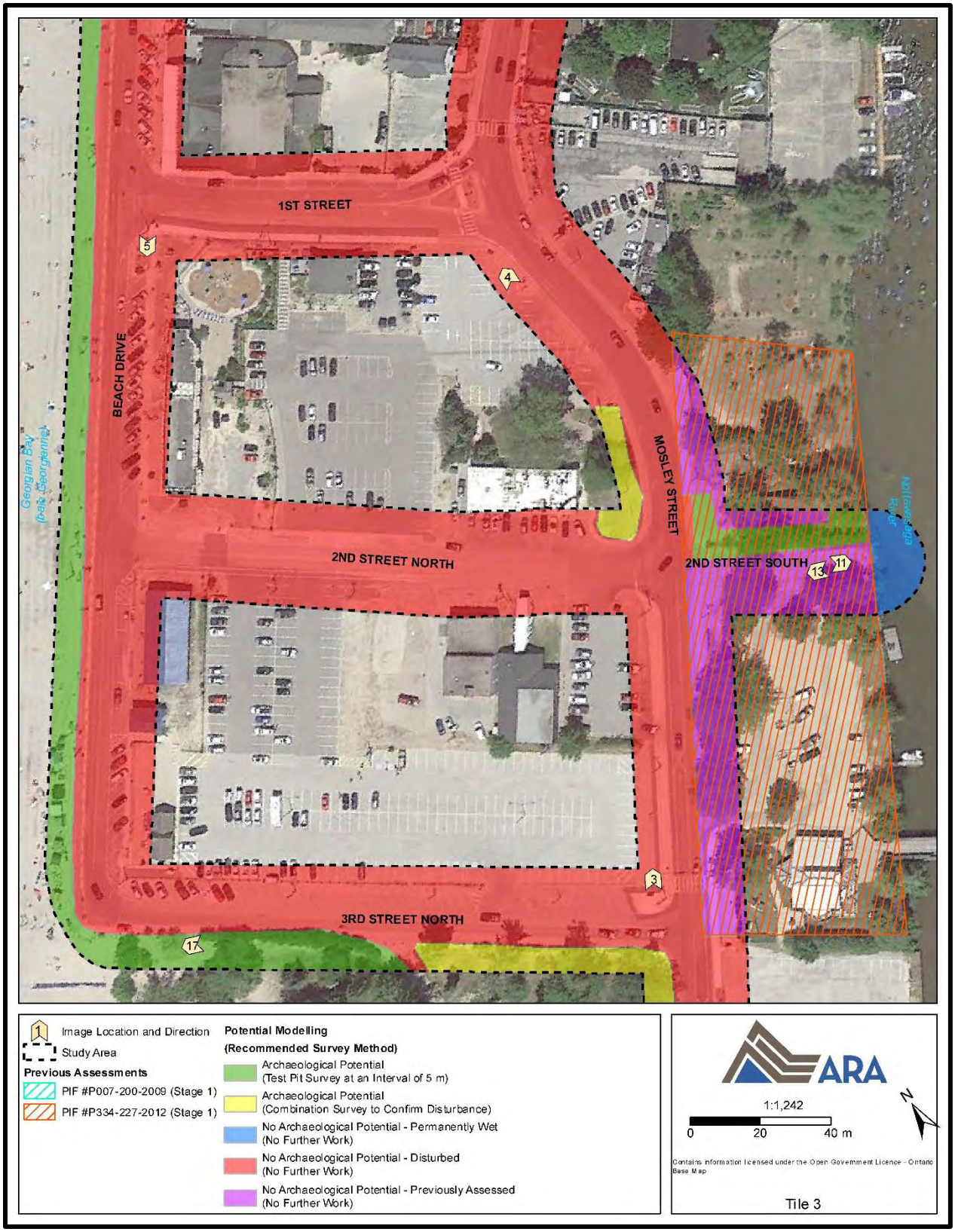

Map 12: Potential Modelling and Recommendations – Tile 3
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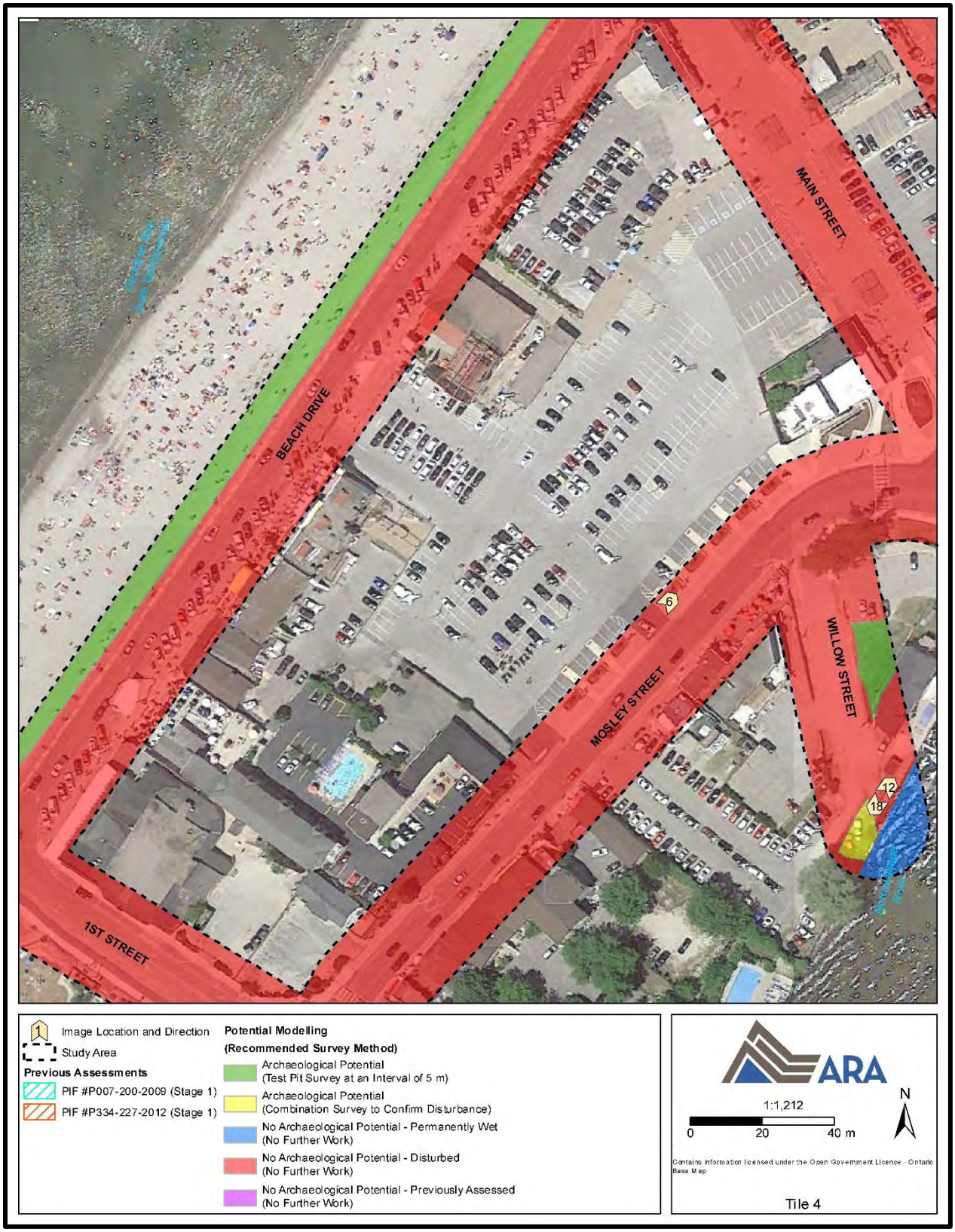

Map 13: Potential Modelling and Recommendations – Tile 4
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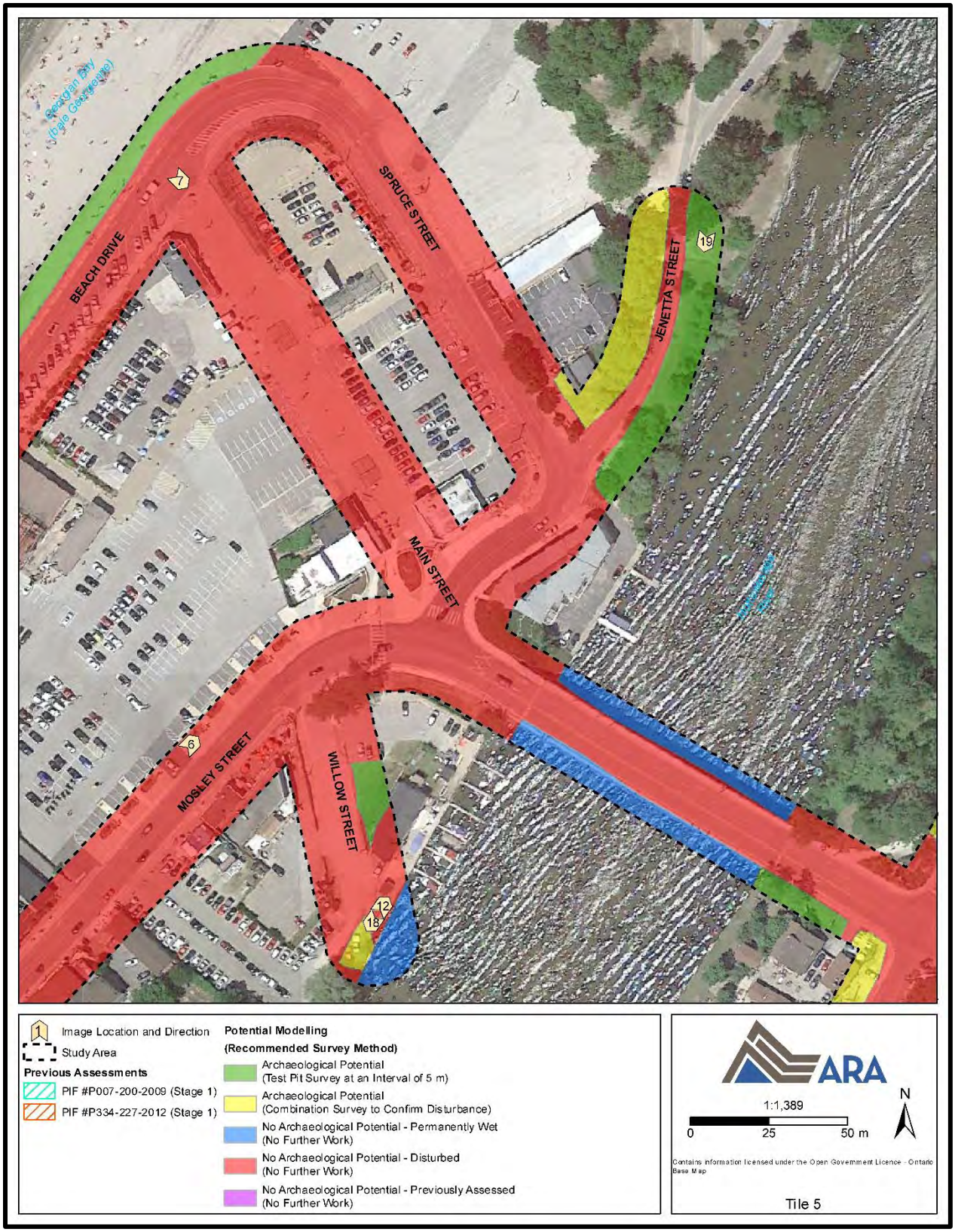

Map 14: Potential Modelling and Recommendations – Tile 5
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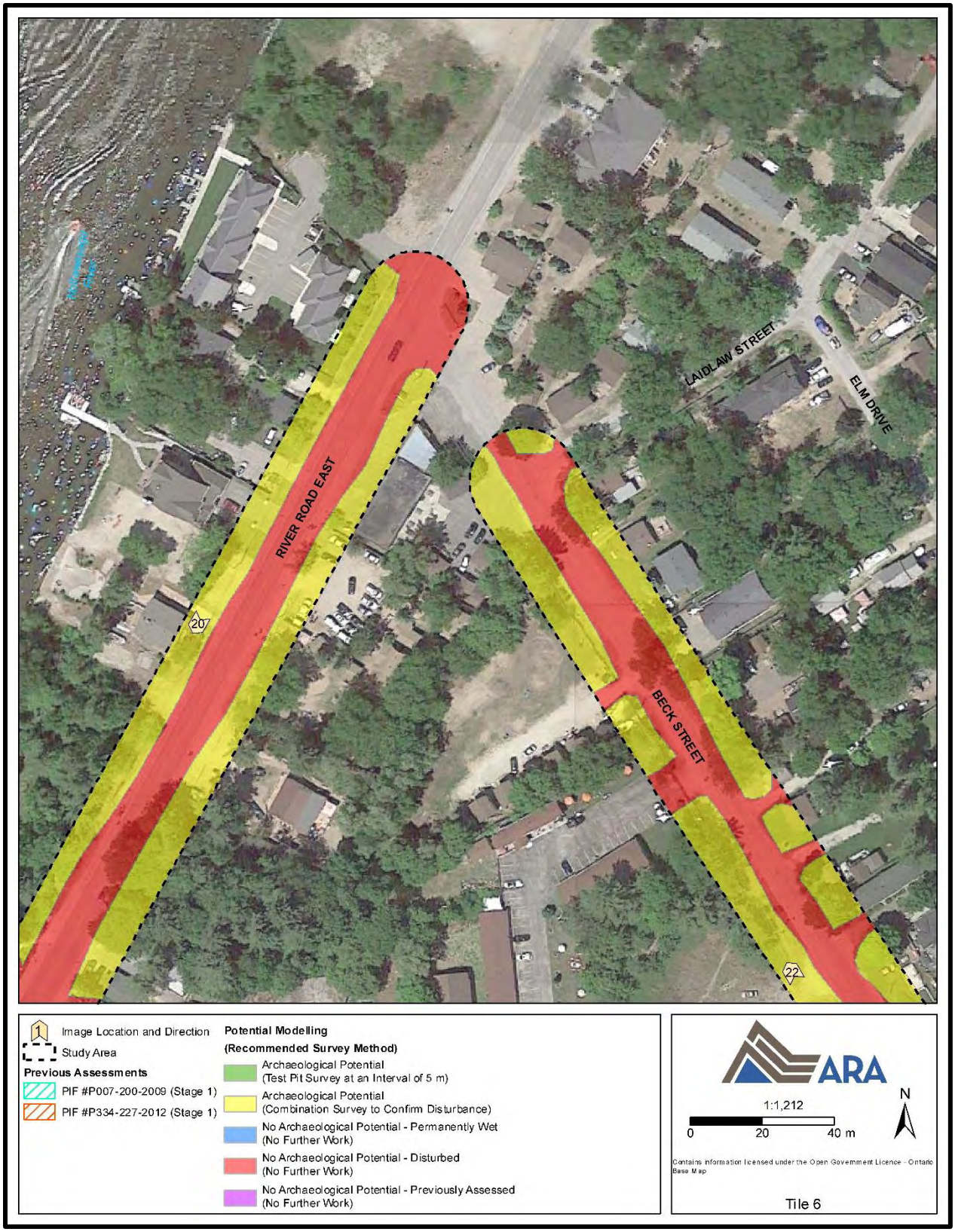

Map 15: Potential Modelling and Recommendations – Tile 6
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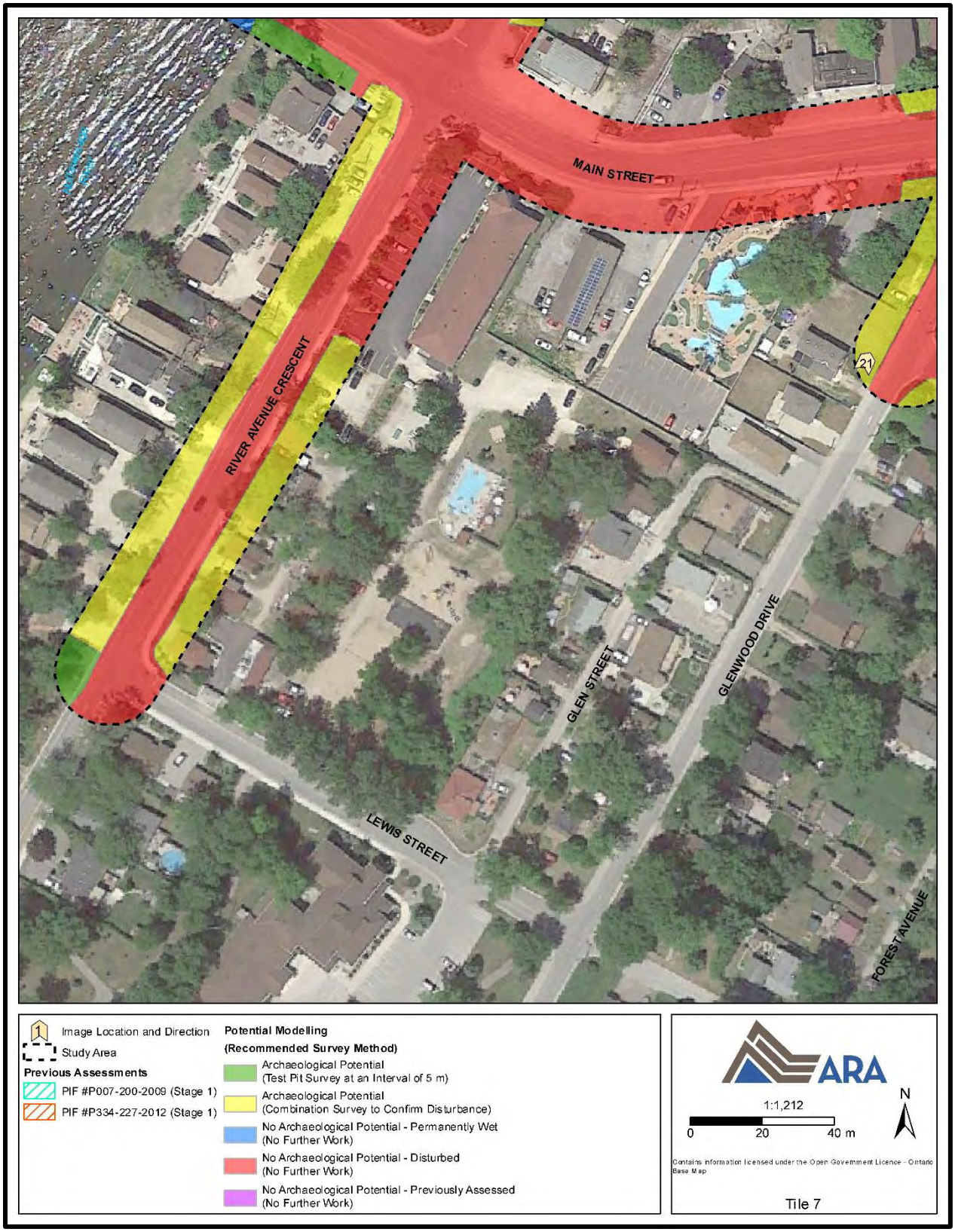

Map 16: Potential Modelling and Recommendations – Tile 7
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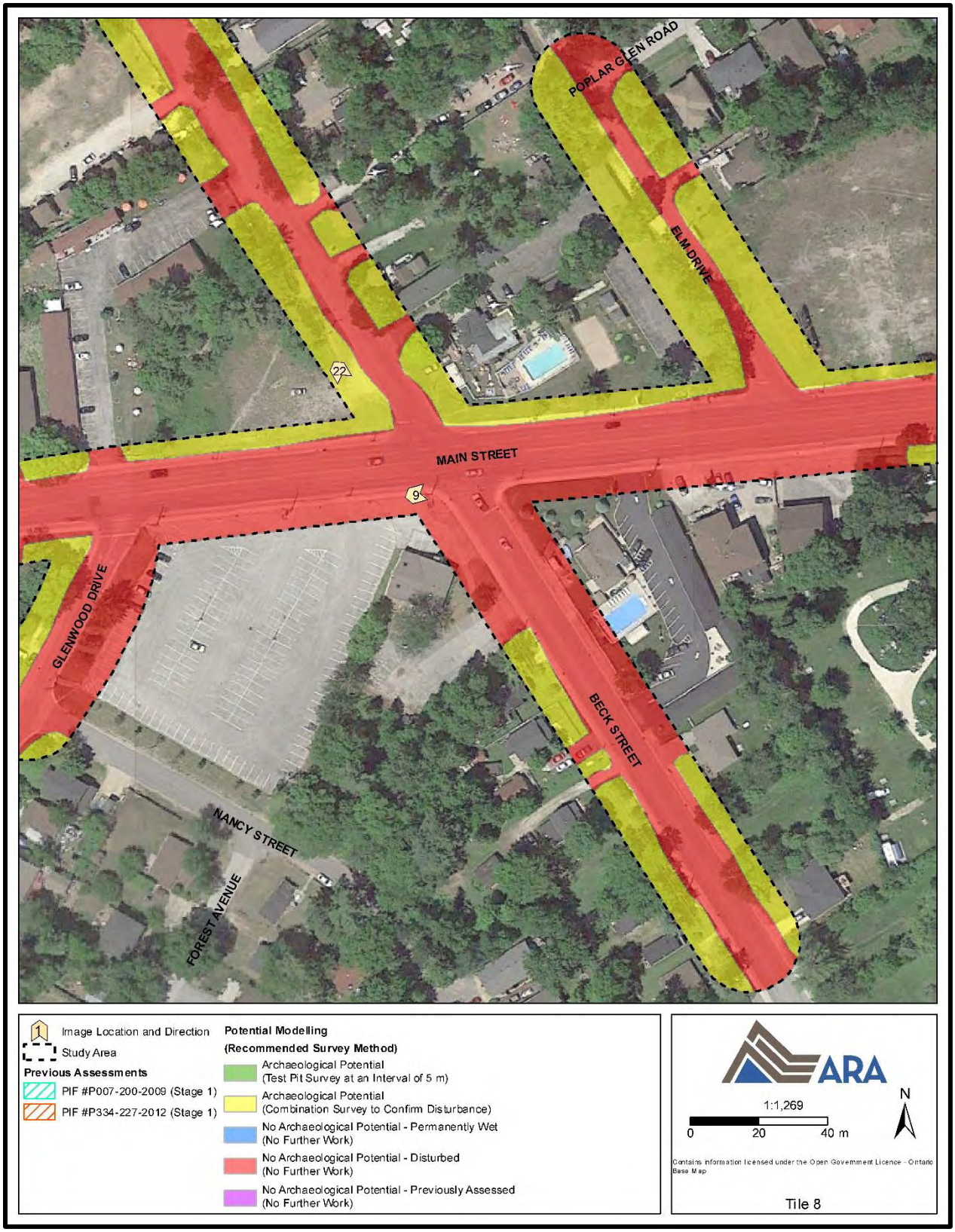

Map 17: Potential Modelling and Recommendations – Tile 8
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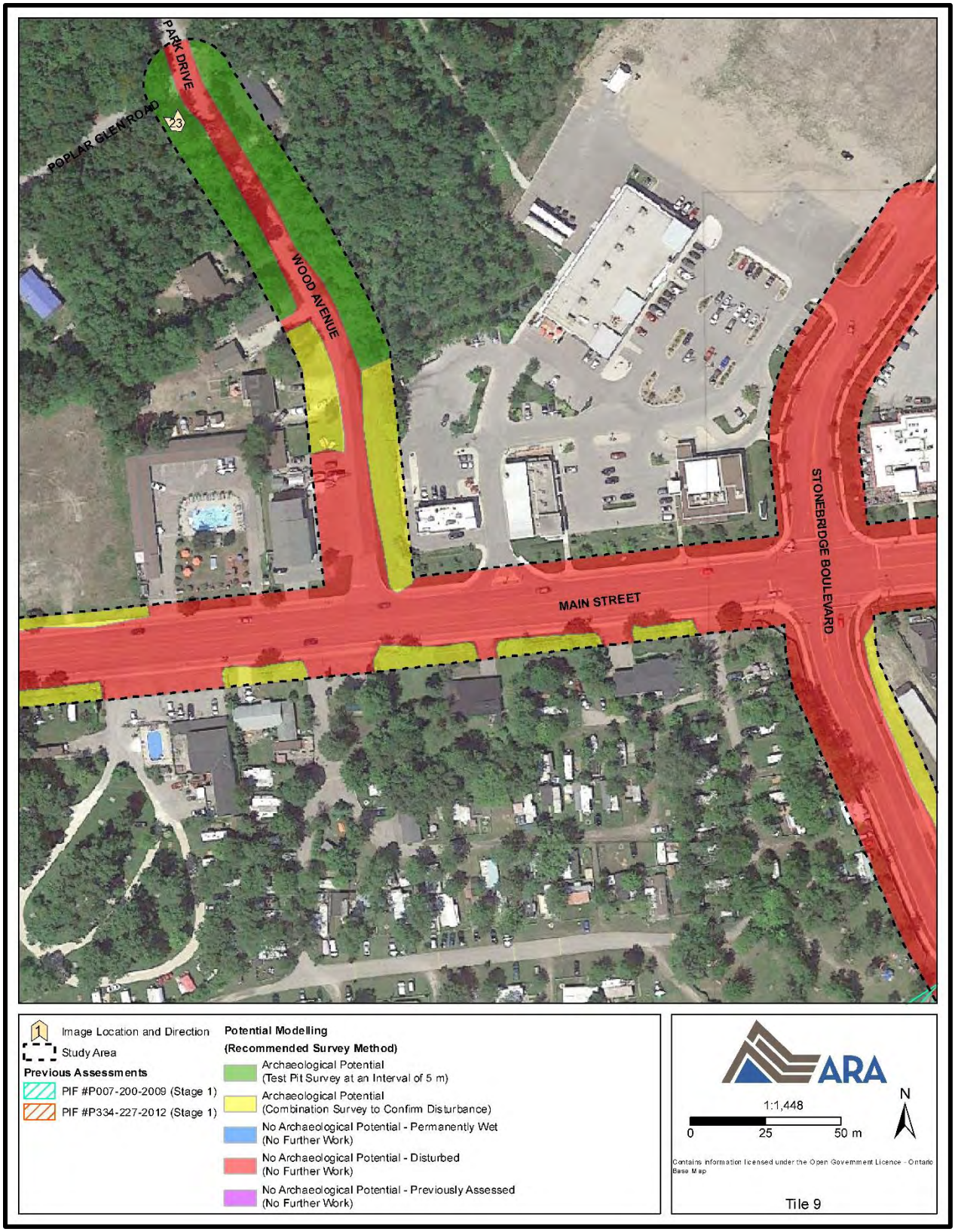

Map 18: Potential Modelling and Recommendations – Tile 9
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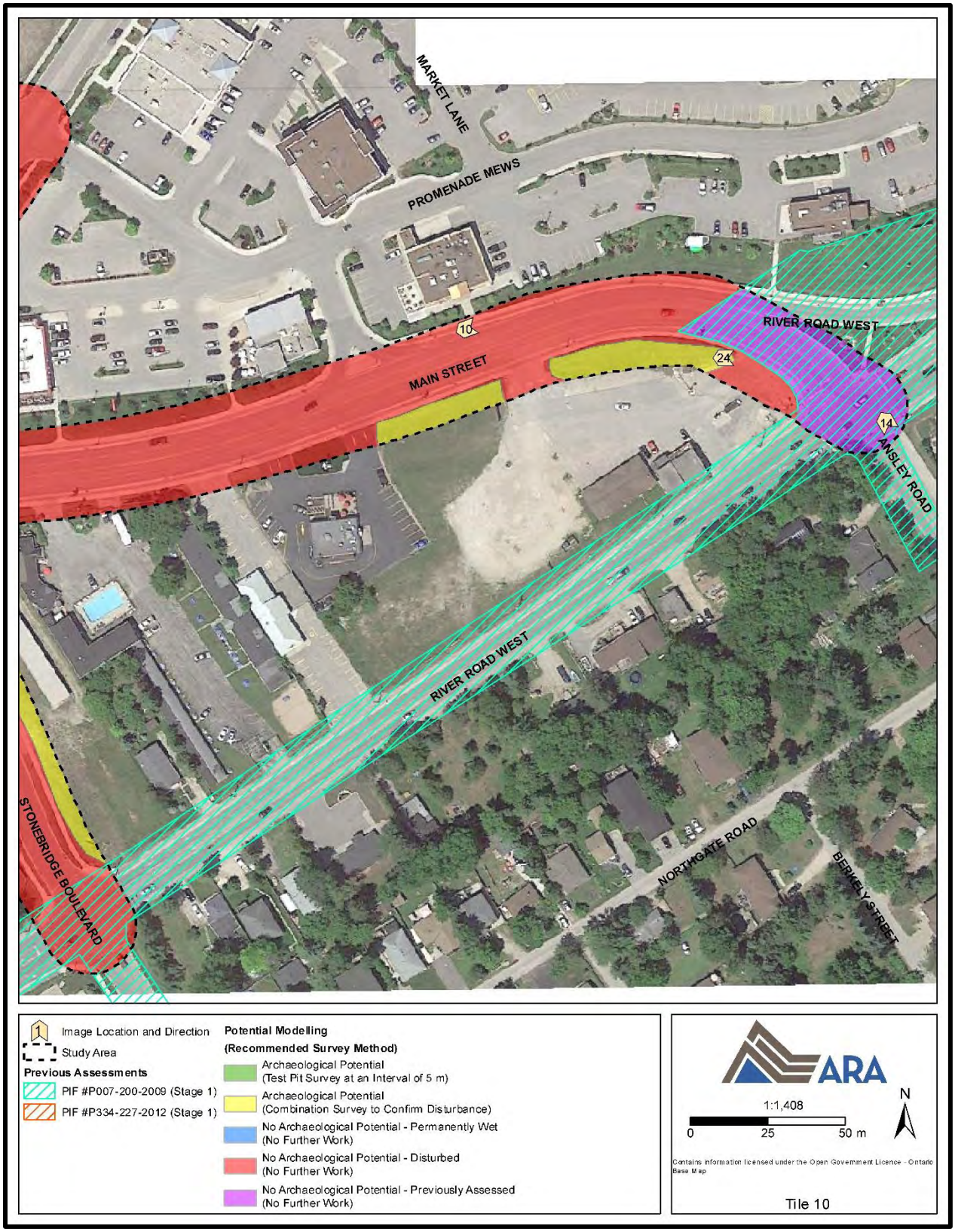

Map 19: Potential Modelling and Recommendations – Tile 10
(Produced under licence using ArcGIS® software by Esri, © Esri)

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ARCHAEOLOGY | HERITAGE | OUTREACH | EDUCATION

DRAFT

Stage 1 Archaeological Assessment
Main Street Reconstruction & Downtown Revitalization
Municipal Class Environmental Assessment
Town of Wasaga Beach
Part of Lots 26–27, Concession 9
Geographic Township of Flos
Part of Lots 9–10, Concession 16
Geographic Township of Sunnidale
Simcoe County, Ontario

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Licensed under
P.J. Racher
MHSTCI Licence #P007
PIF #P007-1068-2019
ARA File #2018-0381

02/04/2020

Supplementary Documentation

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1.0 SUPPLEMENTARY DOCUMENTATION

1.1 Detailed Site Location Information

In keeping with Section 7.6.1 of the 2011 *Standards and Guidelines for Consultant Archaeologists*, detailed site location information was not included within the project report. The locations of the previously identified sites falling within 300 m of the study area appear in SD Map 1.

2.0 SD MAPS

SD Map 1: Features of Potential with Site Information
(Produced under licence using ArcGIS® software by Esri, © Esri)

Appendix I:
Cultural Heritage Assessment

ARCHAEOLOGY | HERITAGE | OUTREACH | EDUCATION

DRAFT

Cultural Heritage Assessment Report
Main Street Reconstruction and Downtown Revitalization
Class Environmental Assessment
The Corporation of the Town of Wasaga Beach
Lots 26 and 27, Concessions 8 and 9
Geographic Township of Flos
Lots 9 and 10, Concession 16
Geographic Township of Sunnidale
County of Simcoe, Ontario

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HR-162-2019
Project # 2018-0382

19/12/2019

Original Report

EXECUTIVE SUMMARY

Under a contract awarded in August 2019 by Tatham Engineering Limited, on behalf of the Town of Wasaga Beach, Archaeological Research Associates Ltd. carried out a Cultural Heritage Assessment Report of structures and landscapes with the potential to be impacted by the proposed Main Street Reconstruction and Downtown Revitalization Environmental Assessment project in the Town of Wasaga Beach, County of Simcoe, Ontario.

The Town of Wasaga Beach Public Works Department has requested engineering, urban design, planning, and landscape architecture services relating to a Municipal Class Environmental Assessment, Schedule 'C' and the planning process for the revitalization of Main Street from River Road West to Mosley Street as well as Mosley Street from Main Street to 6th Street and Beach Drive. Among other tasks, the proposed work includes:

- Development of conceptual road cross-sections and streetscape visions;
- Options for road/streetscape cross-sections;
- Completion of a Detailed Analysis to identify impacts on the adjacent road network, including but not limited to, the intersections of Main Street/Beck Street, Beck Street/River Road East, River Road East/Main Street and Spruce Street/Mosley Street; and
- Provision of a list of viable streetscaping alternatives.

Mosley and Main Streets are part of the key corridors in the Town of Wasaga Beach important in servicing commuter, recreational and tourist traffic. Currently, Mosley Street is a two-lane road with a rural cross-section (i.e., partly paved shoulders and open ditches) to 3rd Street at which point it transitions to an urban cross section (i.e., curbs, gutters and sidewalks) from 3rd Street north to Main Street. Main Street is a three-lane road with an urban cross-section from Mosley Street to approximately Glenwood Drive, at which point it becomes four lanes in the remainder of the study area to River Road West. The side streets included in the west side of the study area exhibit rural cross-sections, while those east of the Main Street Bridge include a mix of both urban and rural configurations.

The Cultural Heritage Assessment Report approach included:

- Background research concerning the project and historical context of the study area;
- Consultation with Town of Wasaga Beach and Simcoe County staff regarding heritage matters in the study area;
- Identification of any designated or recognized properties within the limits of the study area;
- On-site inspection and creation of an inventory of all properties with potential Built Heritage Resources and Cultural Heritage Landscapes within the study area;
- A description of the location and nature of potential cultural heritage resources;
- Evaluation of each potential cultural heritage resource against the criteria set out in Ontario Regulation 9/06, and 10/06, where applicable, for determining cultural heritage value or interest;
- Evaluation of potential project impacts; and

- Provision of suggested strategies for the future conservation of identified cultural heritage resources.

As a result of consultation and field survey, the following Built Heritage Resources were identified: 227 Mosley Street (BHR 1), 208 Mosley Street (BHR 2), 183 Mosley Street (BHR 3), 9 4th Street (BHR 4), 25 Main Street (BHR 5), 15 Willow Street (BHR 6), Main Street Bridge (BHR 7), 35 River Road East (BHR 8), 72 Main Street (BHR 9), 88 Main Street (BHR 10), 52 River Avenue Crescent (BHR 11), 44 Beck Street (BHR 12), 112 Beck Street (BHR 13), 116 Beck Street (BHR 14), 128 Beck Street (BHR 15), 136 Beck Street (BHR 16), 220 Main Street (BHR 17) and 10 Ansley Road (BHR 18). Five Cultural Heritage Landscapes were also identified in the study area: Snake Island (CHL 1), the Beach (CHL 2), Beck Square (CHL 3), the Entertainment District (CHL 4) and the Nottawasaga River (CHL 5).

Detailed designs or plans for the reconstruction of Main Street and revitalization of downtown Wasaga Beach were not available at the time this report was written, however it is not anticipated that the heritage attributes of BHRs 1-6 and 8-18 or CHLs 1, and 3-5 will be directly impacted by the proposed project. Main Street Bridge (BHR 7) and the Beach (CHL 2) are within the study area and may be impacted by the proposed reconstruction of Main Street and revitalization of downtown Wasaga Beach. There may also be some indirect impacts to the identified resources during construction activities and minor changes to the character of the existing frontage of properties along Mosley and Main Streets due to the reconstruction/revitalization-related activities. Some of these indirect impacts may in fact prove to be positive as the aesthetic of the streetscape is improved, opportunities to remove more recent infrastructure in order to restore original views to identified cultural heritage resources are identified, and/or efforts can be undertaken to interpret cultural heritage resources (i.e., with plaques or public art).

As a result of this Cultural Heritage Assessment Report, the following mitigation strategies are recommended:

- That following the development of design alternatives, a Heritage Impact Assessment (HIA) should be prepared for the Beach CHL (CHL 2), a potential provincially significant heritage property, to ensure that its identified heritage attributes are not impacted as a result of reconstruction or revitalization work along Beach Drive. This study should be undertaken by a qualified heritage consultant.
- That following the development of design alternatives, a HIA should be prepared for Beck Square (CHL 3) to ensure that its identified heritage attributes are not impacted as a result of reconstruction or revitalization work along Mosley Street and 1st Street North. This study should be undertaken by a qualified heritage consultant.
- That as the Main Street Bridge (BHR 7) is over 40 years old, the MCEA system requires the completion of a Cultural Heritage Evaluation Report (CHER) should any future improvement work be planned for the bridge. If a CHER has not yet been completed for the bridge and work is planned as part of the Main Street Reconstruction and Downtown Revitalization EA, a CHER should be undertaken. A HIA may also be required. These studies should be undertaken by a qualified heritage consultant.
- That development and site alteration should be isolated from identified BHRs, CHLs and their heritage attributes. During the planning and design phases of the reconstruction/

revitalization of Main and Mosley Streets, care should be taken to avoid, where possible, the 18 BHRs and five CHLs.

- That should project-related activities be expected to impact any of the identified BHRs or CHLs noted in this report, a qualified heritage consultant should be contracted to complete property specific HIAs and provide detailed mitigation options to address the proposed work on the resources.
- That road reconstruction and revitalization, particularly the possible installation of sidewalks, bike lanes, seating areas and/or transit stops, may provide an opportunity to interpret some of the identified cultural heritage resources (i.e., with plaques, public art).
- That public consultation may result in additional potential cultural heritage resources being identified. These potential cultural heritage resources should be reviewed by a qualified heritage consultant to: 1) determine their cultural heritage value or interest, 2) evaluate potential project impacts, and 3) suggest strategies for future conservation of any identified cultural heritage resources.
- That should the reconstruction and revitalization activities or the project location expand beyond the scope examined in this report, a qualified heritage consultant should be retained to determine the potential impacts and suggest mitigation measures.
- That previously-unrecognized cultural heritage resources with cultural heritage value or interest discussed in this report *may* be worthy of inclusion on the Town of Wasaga Beach Heritage Registry.
- That this Cultural Heritage Assessment Report should be provided to staff/planners at the Town of Wasaga Beach and the County of Simcoe.

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GLOSSARY OF ABBREVIATIONS

ARA – Archaeological Research Associates Ltd.
BHR – Built Heritage Resource
CHER – Cultural Heritage Evaluation Report
CHL – Cultural Heritage Landscape
CHVI – Cultural Heritage Value or Interest
EA – Environmental Assessment
HIA – Heritage Impact Assessment
HSMBC – Historic Sites and Monuments Board of Canada
MCEA – Municipal Class Environmental Assessment
MCL – (Former) Ministry of Culture
MHSTCI – Ministry of Heritage, Sport, Tourism and Culture Industries
MTC – (Former) Ministry of Tourism and Culture
MTCS – (Former) Ministry of Tourism, Culture and Sport
OHA – Ontario Heritage Act
OHT – Ontario Heritage Trust
O. Reg. – Ontario Regulation
PIC – Public Information Centres
PPS – Provincial Policy Statement

PERSONNEL

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Heritage Operations Manager: K.J. Galvin, MA, RPP, MCIP, CAHP
Project Manager: L. Benjamin, MAES, RPP, MCIP, CAHP
Site Visit: L. Benjamin, S. Clarke, BA
Historical Research: S. Clarke
Photography: L. Benjamin
Cartographer: K. Brightwell (GIS), L. Bailey (GIS)
Technical Writers: L. Benjamin, K.J. Galvin, P. Young, MA, CAHP, J. McDermid, BA

Two-page Curriculum Vitae (CV) for key team members that demonstrate the qualifications and expertise necessary to preform cultural heritage work in Ontario are provide in Appendix B.

1.0 PROJECT CONTEXT

Under a contract awarded in August 2019 by Tatham Engineering Limited, on behalf of the Town of Wasaga Beach, Archaeological Research Associates Ltd. (ARA) carried out a Cultural Heritage Assessment Report (CHAR) of structures and landscapes with the potential to be impacted by the proposed Main Street Reconstruction and Downtown Revitalization Environmental Assessment project in the Town of Wasaga Beach, County of Simcoe, Ontario.

Mosley and Main Streets are part of the key corridors in the Town of Wasaga Beach important in servicing commuter, recreational and tourist traffic. Currently, Mosley Street is a two-lane road with a rural cross-section (i.e., partly paved shoulders and open ditches) to 3rd Street at which point it transitions to an urban cross-section (i.e., curbs, gutters and sidewalks) from 3rd Street north to Main Street. Main Street is a three-lane road with an urban cross-section from Mosley Street to approximately Glenwood Drive, at which point it becomes four lanes in the remainder of the study area to River Road West. The side streets included in the west side of the project location exhibit rural cross-sections, while those east of the Main Street Bridge include a mix of both urban and rural configurations.

The Town of Wasaga Beach Public Works Department has requested engineering, urban design, planning, and landscape architecture services relating to a Municipal Class Environmental Assessment (MCEA), Schedule 'C' and the planning process for the revitalization of Main Street. Among other tasks, the proposed work includes:

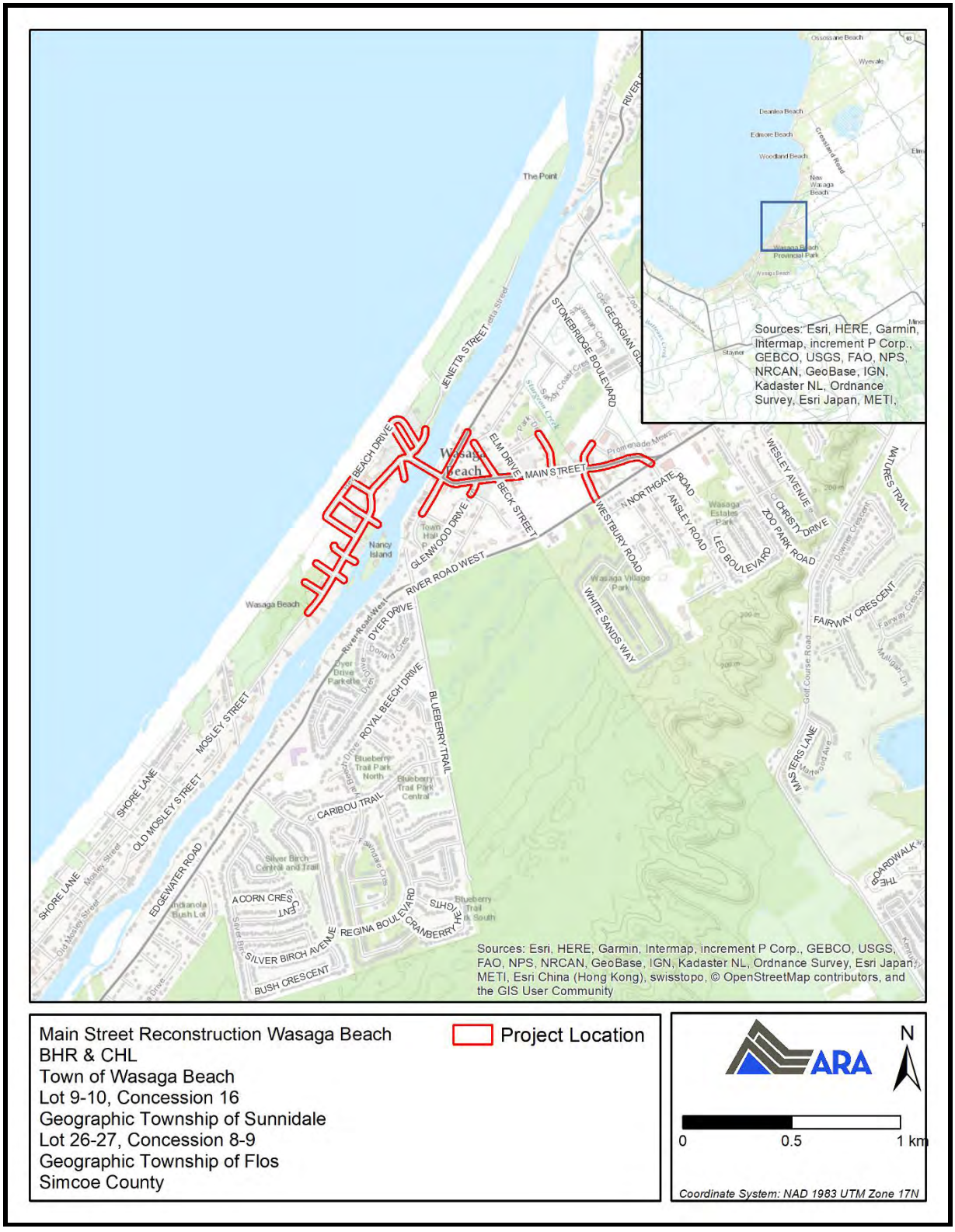
- Development of conceptual road cross-sections and streetscape visions;
- Options for road/streetscape cross-sections;
- Completion of a Detailed Analysis to identify impacts on the adjacent road network, including but not limited to, the intersections of Main Street/Beck Street, Beck Street/River Road East, River Road East/Main Street and Spruce Street/Mosley Street; and
- Provision of a list of viable streetscaping alternatives.

These proposed urbanization activities are to be reviewed with reference to any potential environmental impacts with mitigation options provided for any potential impacts, if necessary.

The project location consists of Mosley Street from south of 6th Street North to Main Street, Beach Drive, and Main Street from Mosley Street to River Road West in the Town of Wasaga Beach. The project location falls on Lots 26 and 27, Concessions 8 and 9, Geographic Township of Flos, and Lots 9 and 10, Concession 16, Geographic Township of Sunnidale, County of Simcoe, Ontario (see Map 1).The study area includes the road, the right of way and the adjacent property parcels

The purpose of this assessment is to identify and evaluate the cultural heritage resources within the study area that may be impacted by the MCEA that is being conducted in relation to the reconstruction of Main Street and revitalization of the downtown. This assessment was conducted in accordance with the aims of the *Environmental Assessment Act*, R.S.O. 1990, *Provincial Policy Statement* (2014) and the *Ontario Heritage Act*, R.S.O. 1990, c. O.18, *County of Simcoe Official Plan* (2016), and *Official Plan of the Town of Wasaga Beach* (2016).

All notes, photographs and records pertaining to the heritage assessment are currently housed in ARA's office located at 900 Guelph Street – Unit 219, Kitchener, Ontario. Subsequent long-term storage will occur at the same location.



Map 1: Project Location in the Town of Wasaga Beach
(Produced by ARA under licence using ArcGIS® software by Esri, © Esri)

2.0 METHOD

The framework for this assessment report is provided by provincial environmental and planning legislation and policies as well as regional and local municipal Official Plans and guidelines. Within the *Environmental Assessment Act,* the environment includes *"any building, structure, machine or other device or thing made by humans."* An Environmental Assessment (EA) is a study that evaluates both the potential positive and/or negative effects of a project on the environment. This study is conducted as part of a streamlined self-assessment EA process known as a MCEA, which applies to routine projects grouped into classes that range from A (minor undertakings) to C (construction of new large facilities). The MCEA applies to municipal infrastructure undertakings including roads, water and wastewater projects.

The 2014 *Provincial Policy Statement* (PPS) promotes the conservation of cultural heritage resources through polices in Section 2.6. As per policy 2.6.1, "Significant built heritage resources and significant cultural heritage landscapes shall be conserved" (2014:29).

With respect to cultural heritage, one of the goals of the *County of Simcoe Official Plan* is to "protect, conserve, and enhance the County's natural and cultural heritage" (2016:13). The *Official Plan of the Town of Wasaga Beach* contains policies that address cultural heritage resources and the *Environmental Assessment Act,* such as policy 15.2.6.9 that states: "Council may employ relevant legislation to encourage the preservation and enhancement of cultural heritage resources may include the *Heritage Act*, the *Planning Act*, as amended, the *Municipal Act*, as amended, the *Environmental Assessment Act*, as amended, and the *Aggregate Resources Act,* as amended*"* (2016:112).

Through careful analysis of the heritage values and attributes of an identified resource, coupled with an analysis of project impacts and an outline of potential mitigation measures, the aims of the *Environmental Assessment Act* and these Official Plans can be met.

2.1 Key Concepts

The following concepts require clear definition in advance of the methodological overview and proper understanding is fundamental for any discussion pertaining to cultural heritage resources:

- **Cultural Heritage Value or Interest** (CHVI), also referred to as Heritage Value, is identified if a property meets one of the criteria outlined in O. Reg. 9/06 namely historical or associative value, design or physical value and/or contextual value. Provincial significance is defined under *Ontario Heritage Act (*OHA*) O. Reg*. 10/06.
- **Built Heritage Resource** (BHR) can be defined in the *PPS* as: "a building, structure, monument, installation or any manufactured remnant that contributes to a property's cultural heritage value or interest as identified by a community, including an Aboriginal community. Built heritage resources are generally located on property that has been designated under Parts IV or V of the OHA, or included on local, provincial and/or federal registers" (MMAH 2014:39).
- **Cultural Heritage Landscape** (CHL) is defined in the *PPS* as: "a defined geographical area that may have been modified by human activity and is identified as having cultural

heritage value or interest by a community, including an Aboriginal community. The area may involve features such as structures, spaces, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association. Examples may include, but are not limited to, heritage conservation districts designated under the *Ontario Heritage Act*; villages, parks, gardens, battlefields, mainstreets and neighbourhoods, cemeteries, trailways, viewsheds, natural areas and industrial complexes of heritage significance; and areas recognized by federal or international designation authorities (e.g., a National Historic Site or District designation, or a UNESCO World Heritage Site)" (MMAH 2014:40).

It is recognized that the heritage value of a CHL is often derived from its association with historical themes that characterize the development of human settlement in an area (Scheinman 2006). In Ontario, typical themes that may convey heritage value within a community include, but are not limited to: 1) Pre-Contact habitation, 2) early European exploration, 3) early European and First Nations contacts, 4) pioneer settlement, 5) the development of transportation networks, agriculture and rural life, 6) early industry and commerce, and/or 7) urban development. Individuals CHLs may be related to a number of these themes simultaneously.

The *Operational Guidelines for the Implementation of the World Heritage Convention* defines several types of CHLs: 1) designed and created intentionally by man, 2) organically evolved landscapes that fall into two-subcategories (relic/fossil or continuing), and 3) associative cultural landscapes (UNESCO 2008:86). The former Ministry of Culture's (MCL) *Information Sheet #2 Cultural Heritage Landscapes* repeats these definitions to describe landscapes in Ontario (MCL 2006c).

- **Conserved** means "the identification, protection, management and use of built heritage resources, cultural heritage landscapes and archaeological resources in a manner that ensures their cultural heritage value or interest is retained under the *Ontario Heritage Act*. This may be achieved by the implementation of recommendations set out in a conservation plan, archaeological assessment, and/or heritage impact assessment. Mitigative measures and/or alternative development approaches can be included in these plans and assessments" (MMAH 2014:40).
- **Heritage Attributes** are defined in the *Ontario Heritage Act* as: "the principal features or elements that contribute to a protected heritage property's cultural heritage value or interest, and may include the property's built or manufactured elements, as well as natural landforms, vegetation, water features, and its visual setting (including significant views or vistas to or from a protected heritage property means, in relation to real property, and to the buildings and structures on the real property, the attributes of the property, buildings and structures that contribute to their cultural heritage value or interest" (Government of Ontario 2009).
- **Significant** in reference to cultural heritage is defined as: "resources that have been determined to have cultural heritage value or interest for the important contribution they make to our understanding of the history of a place, an event, or a people" (MMAH 2014:49).

2.2 Types of Recognition

BHRs and CHLs are broadly referred to as cultural heritage resources. A variety of types of recognition exist to commemorate and/or protect cultural heritage resources in Ontario.

The National Historic Sites program commemorates important sites, people or events that have had a nationally significant effect on, or illustrate a nationally important aspect of, the history of Canada. The Minister of Heritage and Multiculturalism on the advice of the Historic Sites and Monuments Board of Canada (HSMBC) makes recommendations to the program. Another form of recognition at the federal level is the Canadian Heritage Rivers System program. It is a federal program to recognize and conserve rivers with outstanding natural, cultural and recreational heritage. It is important to note that both of these federal commemoration programs do not offer protection from alteration or destruction.

The Ontario Heritage Trust (OHT) operates the Provincial Plaque Program that has over 1,250 provincial plaques recognizing key people, places and events that shaped the province. Additionally, properties owned by the province may be recognized as a "provincial heritage property" (MTC 2010). A cultural heritage resource may also be protected through an OHT or municipal easement. Many municipal heritage committees and historical societies provide plaques for local places of interest. "One role of municipal heritage groups (i.e., municipal heritage committees, historical societies) is to educate and inform the community on local heritage and several ways this could occur could include: producing descriptive guides and newsletters or by installing commemorative plaques" (MCL 2007:8).

Under Section 27 of the OHA, a municipality must keep a Municipal Heritage Register. A Register lists designated properties (those protected by Part IV (individual properties) or Part V (Heritage Conservation Districts) designations under the OHA as well as other properties of cultural heritage value or interest in the municipality. Properties on this list that are not formally designated are commonly referred to as "listed." Listed properties are flagged for planning purposes and are afforded a 60-day delay in demolition if a demolition request is received.

2.3 Approach

The *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* indicates a need to describe the "affected environment" that is "a spatially defined area within which land will be altered as a result of the proponent's development" (MCL 1992:3). As such, ARA completes in-depth research and evaluation of any potential cultural heritage resource within the project area. ARA's business practice also considers a larger study area that takes into account adjacent properties. This ensures that every BHR and CHL that may be subject to potential indirect project impacts is identified.

A combination of background research, consultation with the local community and field survey is essential to identify and effectively evaluate properties with potential BHRs and CHLs in a meaningful and objective format.

2.3.1 Historical Research

Background information is obtained from aerial photographs, historical maps (i.e., illustrated atlases), archival sources (i.e., historical publications and records), published secondary sources (online and print) and local historical organizations.

2.3.2 Consultation

Consultation with the local community is essential for determining the community value of cultural heritage resources. At project commencement, ARA contacts the relevant local and regional municipalities to inquire about: 1) protected properties within or adjacent to the project location, 2) properties with other types of recognition in or adjacent to the project location, 3) previous studies relevant to the current study, and 4) other heritage concerns regarding the study area or project location. Where possible, information is also sought directly from the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) and the OHT. Public input is an ongoing process with stakeholders providing feedback at various stages in the project. Through this input, additional potential cultural heritage resources may be identified.

2.3.3 Field Survey

The field survey component of an assessment involves the collection of primary data through systematic photographic documentation of all potential cultural heritage resources within the study area, as identified through historical research and consultation. Generally, potential cultural heritage resources are identified by applying a 40-year rolling timeline. This timeline is considered an industry best practice (i.e., MTO 2008). Additionally, the Municipal Class Environmental Assessment system requires the completion of a Cultural Heritage Evaluation Report for any bridges over 40 years of age. A date of 40 years does not automatically attribute CHVI to a resource; rather, that it should be flagged as a potential resource and evaluated for CHVI.

Additional cultural heritage resources may also be identified during the survey itself. Photographs capturing all properties with potential BHRs and CHLs are taken, as are general views of the surrounding landscape. The site visit also assists in confirming the location of each potential cultural heritage resource and helps to determine the relationship between resources. Given that such surveys are limited to areas of public access (i.e., roadways, intersections, non-private lands, etc.), there is always the possibility that obscured cultural heritage resources may be missed or that heritage attributes may be refined upon closer inspection.

2.4 Evaluation of Significance

2.4.1 Local Value

In order to objectively identify cultural heritage resources, O. Reg. 9/06 made under the OHA sets out three principal criteria with nine sub-criteria for determining CHVI (MCL 2006a:20-27). The criteria set out in the regulation were developed to identify and evaluate properties for designation under the OHA. Best practices in evaluating properties that are not yet protected employ O. Reg. 9/06 to determine if they have CHVI. These criteria include: design or physical value, historical or associative value and contextual value.

1. The property has design value or physical value because it,

    i. is a rare, unique, representative or early example of a style, type, expression, material or construction method,
    ii. displays a high degree of craftsmanship or artistic merit, or
    iii. demonstrates a high degree of technical or scientific achievement.

2. The property has historical value or associative value because it,

    i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community,
    ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or
    iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.

3. The property has contextual value because it,

    i. is important in defining, maintaining or supporting the character of an area,
    ii. is physically, functionally, visually or historically linked to its surroundings, or
    iii. is a landmark. O. Reg. 9/06, s. 1 (2).

If a potential cultural heritage resource (BHR or CHL) is found to meet any one of these criteria, it can then be considered an identified resource.

2.4.2 Provincial Significance

Issued under the OHA, O. Reg. 10/06 outlines the criteria to determine if a property is of provincial significance. In order to be a "heritage property of provincial significance" a site must meet one or more of the following criteria:

- The property represents or demonstrates a theme or pattern in Ontario's history;
- The property yields, or has the potential to yield, information that contributes to an understanding of Ontario's history;
- The property demonstrates an uncommon, rare or unique aspect of Ontario's cultural heritage;
- The property is of aesthetic, visual or contextual importance to the province;
- The property demonstrates a high degree of excellence or creative, technical or scientific achievement at a provincial level in a given period;
- The property has a strong or special association with the entire province or with a community that is found in more than one part of the province. The association exists for historic, social, or cultural reasons or because of traditional use;
- The property has a strong or special association with the life or work of a person, group or organization of importance to the province or with an event of importance to the province; or

- The property is located in unorganized territory and the Minister determines that there is a provincial interest in the protection of the property. O. Reg. 10/06, s. 1 (2).

2.5 Evaluation of Impacts

Any potential project impacts on identified BHRs or CHLs must be evaluated, including direct and indirect impacts. *InfoSheet #5: Heritage Impact Assessments and Conservation Plans* (MCL 2006b:3) provides an overview of several major types of negative impacts, including but not limited to:

- Destruction of any, or part of any, significant heritage attributes;
- Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance;
- Shadows created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden;
- Isolation of a heritage attribute from its surrounding environment, context or significant relationship;
- Direct or indirect obstruction of significant views or vistas within, from, or of built and natural features;
- A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces; and
- Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource.

The above direct and indirect impacts are primarily negative impacts but there may be positive effects as a result of an *Environmental Assessment Act* project. For example, more recent infrastructure may be removed to restore the original views to cultural heritage resources or streetscape improvements might be made.

2.6 Mitigation Strategies

If potential impacts on identified heritage resources are determined, proposed conservation or mitigative/avoidance measures must be recommended.

The former MCL's *InfoSheet #5: Heritage Impact Assessments and Conservation Plans* (2006b:3) lists several specific methods of minimizing or avoiding a negative impact on a cultural heritage resource, including but not limited to:

- Alternative development approaches;
- Isolating development and site alteration from significant built and natural features and vistas;
- Design guidelines that harmonize mass, setback, setting, and materials;
- Limiting height and density;
- Allowing only compatible infill and additions;
- Reversible alterations; and
- Buffer zones, site plan control, and other planning mechanisms.

Strategies may also be developed to enhance positive environmental and cultural effects as a result of an EA undertaking

2.7 Summary of Approach

The approach outlined herein is supported by the best practices, guidelines and policies of the following:

- *Provincial Policy Statement* (2014);
- *Ontario Heritage Act* (R.S.O. 1990);
- *Environmental Assessment Act* (R.S.O. 1990);
- *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (MCL 1992);
- *Ontario Heritage Tool Kit* series (MCL 2006a);
- *County of Simcoe Official Plan* (2016); and
- *Official Plan of the Town of Wasaga Beach* (2016).

3.0 HISTORICAL CONTEXT

3.1 Flos Township, Sunnidale Township and County of Simcoe

Although many cultural heritage resources have strong associations with Indigenous communities, all of the features considered in this report can be associated with Post-Contact (rather than Pre-Contact) cultural developments. Accordingly, the history of the initial settlement and growth of Euro-Canadian communities in Flos Township, Sunnidale Township and the County of Simcoe are of direct relevance to the present study, as opposed to that of the Pre-Contact period. Documentation for this period is abundant, ranging from the first sketches of Upper Canada and the written accounts of early explorers to detailed township maps and lengthy histories.

The early history of the project location can be effectively discussed in terms of major historical events. The principal characteristics associated with these events are summarized in Table 1 on the following page.

Table 1: County and Township Settlement History
(Smith 1846; Hunter 1909; Cumming 1970; Watson 2009)

Historical Event	Timeframe	Characteristics
Loyalist Influx	Late 18th century	United Empire Loyalist influx after the American Revolutionary War (1775–1783); British develop interior communication routes and acquire additional lands; John Collins acquires the northern part of the Toronto Carrying Place in 1785; *Constitutional Act* of 1791 creates Upper and Lower Canada
Simcoe County Development	Late 18th and early 19th century	Became part of the expansive Kent County in 1792; Penetanguishene Peninsula Purchase completed in 1798; Nominally became part of Simcoe County in 1798; Lake Simcoe Purchase completed in 1815; Lake Simcoe-Nottawasaga Purchase completed in 1818; All townships fully surveyed by the mid-1830s; Townships ceded to Waterloo County in 1837 and York County 1838; Simcoe County independent after the abolition of the district system in 1849.

Historical Event	Timeframe	Characteristics
Sunnidale Township Formation	Early 19th century	The township before purchase from the Anishinabeg, was key land in the War of 1812 for control of the Upper Great Lakes; The of the Township of Sunnidale was not surveyed until 1832 and 1833; Thomas Kelly laid out the 16 concessions that would make up the township, and William Hawkins surveyed the Sunnidale Road.
Sunnidale Township Development	Mid-19th and early 20th century	It is believed that the area's sandy soil made the land relatively unattractive to the earliest farmers resulting in slow population growth however logging thrived in the area; By 1846, only 3,144 acres were taken up in the township, with 378 acres under cultivation with a small population of 174; Due to the proximity to Wasaga Beach, the area since the 1880s was developed as a cottage and vacation area.
Flos Township Formation	Early 19th century	Flos Township was partially surveyed in 1811 by Samuel Wilmot following his survey of the Penetanguishene Road; John Goessman, D.P.S. later surveyed the remainder of the township, often referred to as the "Old Survey"; Early settlers to Flos Township include David McDougall who settled in 1826 and the Swan brothers who arrived from Ireland and settled in the township in 1836; Many Irish Catholics settled in the township after 1828; The first postmaster was Hugh Marlow in 1837; Many of the earliest settlers were retired from the military.
Flos Township Development	Mid-19th and early 20th century	By the mid-19th century, approximately 5,749 acres were occupied in Flos Township and 685 acres were under cultivation with a population of 200; North Simcoe Railway came to the township in 1879 and helped to establish the towns of Anten Mills, Phelpston and Elmsvale; Principal settlements in the township included Anten Mills, Craighurst, Apto, Phelpston, Crossland, Vigo, Saupin, Waverly, Van Vlack and Allenwood. The modern Township of Springwater was formed in 1994 through the amalgamation of the former Township of Flos, Township of Vespra, Village of Elmvale and part of the Township of Medonte.

3.2 Town of Wasaga Beach

The project location lies at the western extent of the Town of Wasaga Beach. Initially, the Town of Wasaga Beach was a small settlement known as Van Vlack, named after John Van Vlack, whom purchased 69 acres of land near the Nottawasaga River in 1870. A sawmill was constructed by Van Vlack, and by 1896 the settlement had a population of approximately 70 people.

As the 20th century approached, the area began to be exploited for its summer resort capabilities with hotels and cottages dotting the landscape around the mouth of the Nottawasaga River. Cottage courts first appeared in the 1920s, though at this time the western extent of the settlement was modern 18th Street. Wasaga Beach became a police village in 1940, was designated as an improvement district in 1946 and became an incorporated village in 1949 (Watson 2013:12).

In 1974, both Brock's Beach and Springhurst were annexed to Wasaga Beach, which had been incorporated as a town on January 1st of the same year. The influx of visitors to the area and the establishment of the Wasaga Beach Provincial Park put an end to the presence of cars driving on the beach, which was previously the main road of the area. The main (east) end of the town was closed off to all vehicular traffic and became a pedestrian mall. The Town of Wasaga Beach now stretches from the Collingwood boundary in the west to the boundary of Tiny Township in the east.

3.3 Project Location

As discussed in Section 1.1, the project location for this assessment falls on Lots 26 and 27, Concessions 8 and 9, Geographic Township of Flos, and part of Lots 9 and 10, Concession 16 Geographic Township of Sunnidale, County of Simcoe, Ontario.

In an attempt to reconstruct the historic land use of the project location, ARA examined four historical maps that documented past residents, structures (i.e., homes, businesses and public buildings) and features between the mid-19th and early 20th centuries. Specifically, the resources outlined in Table 2 were consulted.

Table 2: Maps and Aerial Photographs Consulted

Year	Map Title	Reference
1871	Map of the County of Simcoe	Hogg
1881	Flos Township	Belden
1881	Sunnidale Township	Belden
1945	Topographic Map	OCUL

The limits of the project location are shown on georeferenced versions of the consulted historical maps shown on Map 2–Map 5.

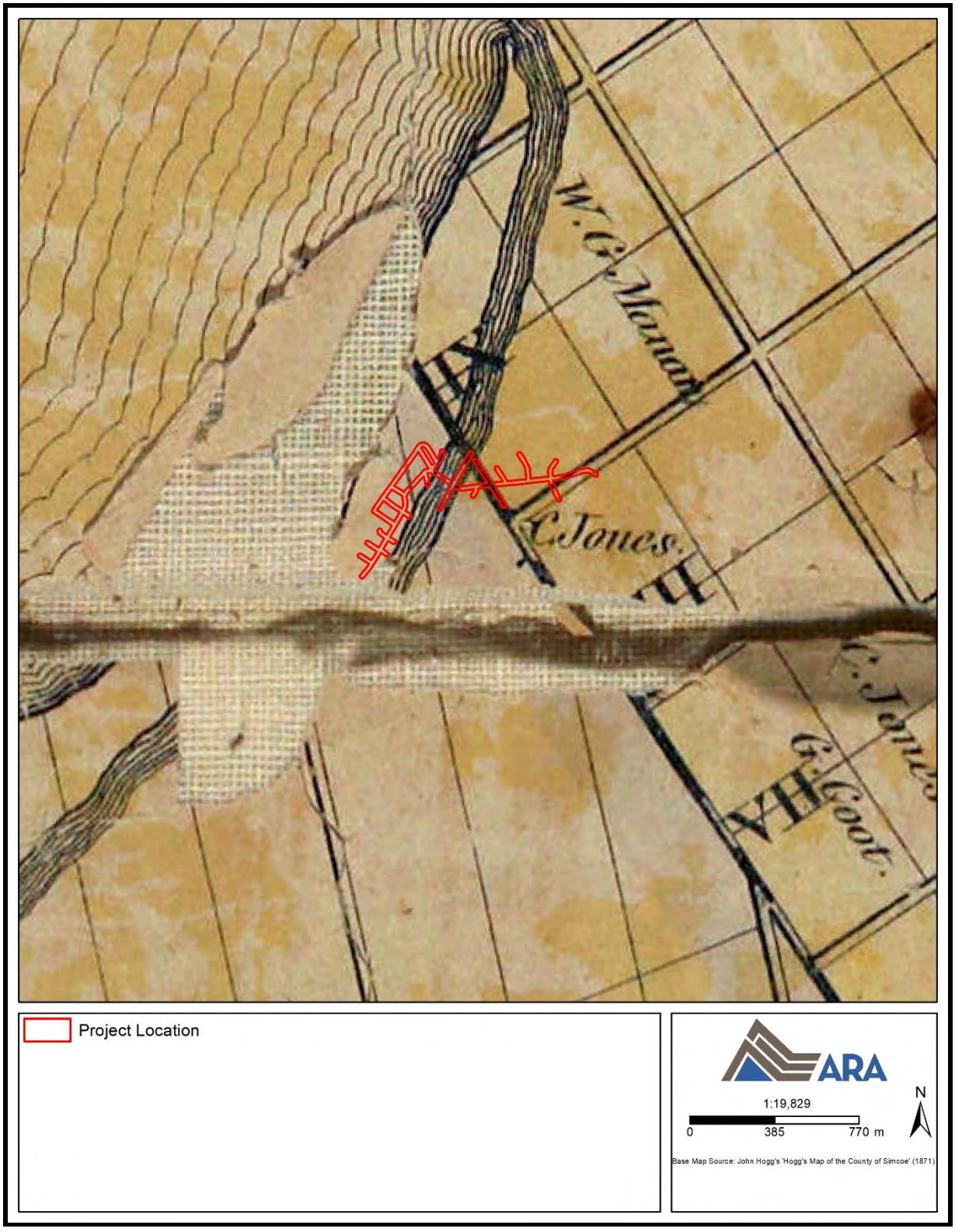
Hogg's 1871, *Map of the County of Simcoe*, coupled with the 1881 maps of the Townships of Flos and Sunnidale do not depict any structures within the study area, nor do they provide any additional settlement information. The Settlement of Van Vlack is indicated east of the project location and the Nottawasaga River traverses centrally through the project location parallel to the Georgian Bay shoreline.

An historic topographic map from 1945 indicates that the project location west of the Nottawasaga River was well-settled with structures depicted flanking Mosley Street and the intersecting side streets. East of the Nottawasaga River was less developed at this time, with River Road East and Beck Street indicated in their current alignments. All structures indicated on the topographic map are of frame construction.

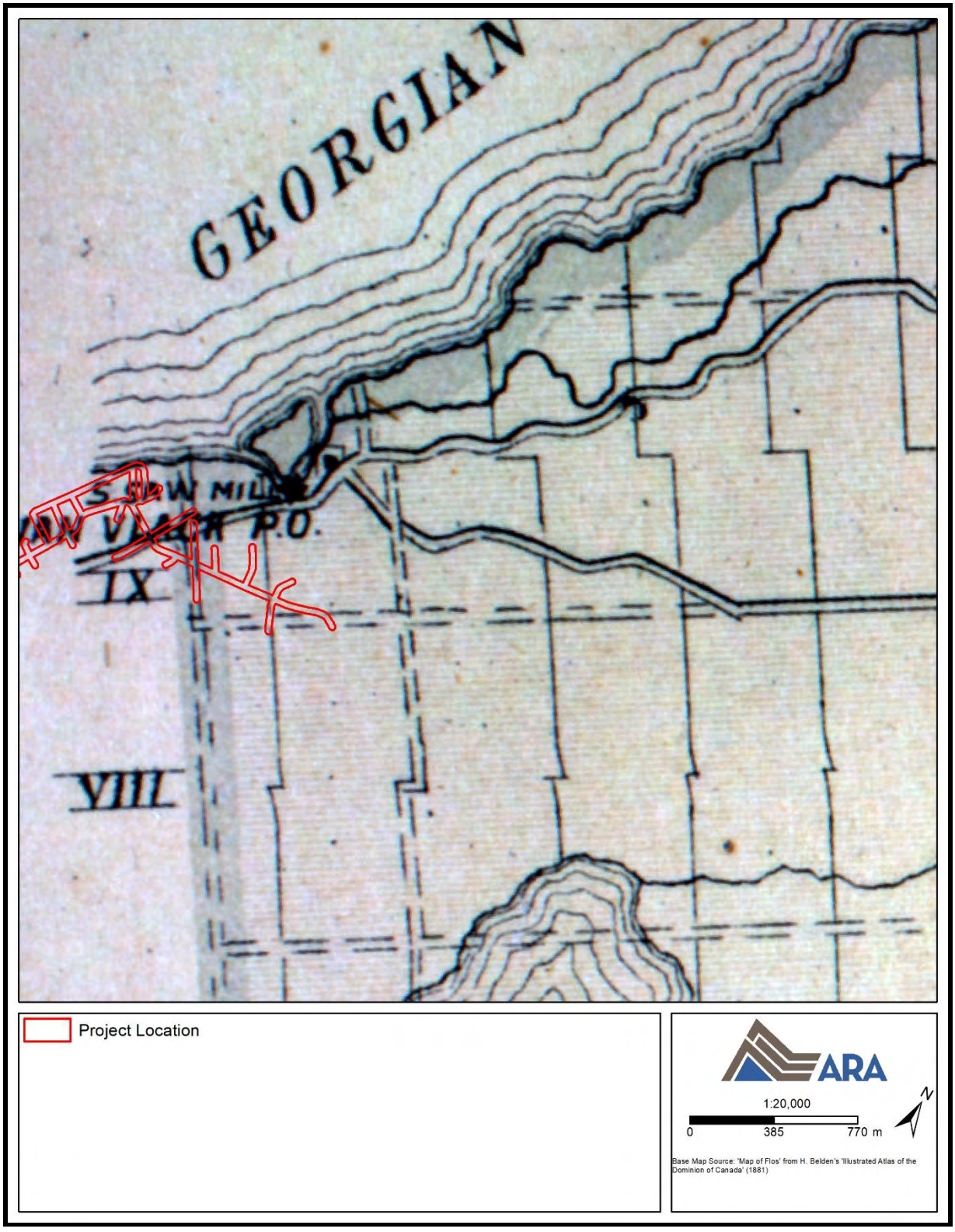
Wasaga Beach has a long history as a summer tourist destination. By the 1900s, railways and roads had improved and visitors had greater access to the area (FNIWBP 2019). Hotels and cottages began to appear along the river and a steel bridge was constructed in 1909 across the Nottawasaga River, improving access to the beachfront (FNIWBP 2019). The resort community took off with the construction of the first hotel on the beach in 1912, the Capstan Inn (FNIWBP 2019). Over the next few decades, several more hotels were built and small privately owned cottages and complexes of rental cottages continued to be constructed (FNIWBP 2019).

Today, Wasaga Beach is still a summer tourist destination as is exemplified by the numerous complexes of rental cottages and small owned cottages that line Mosley Street, many of which provide beach or river access, and fill the side streets off of Main Street. As the historic topographic map from 1945 indicates, many of these cottages are of frame construction, typified by one-storey simple square or rectangular plans. Many of the oldest cottages are clad in wood board painted in

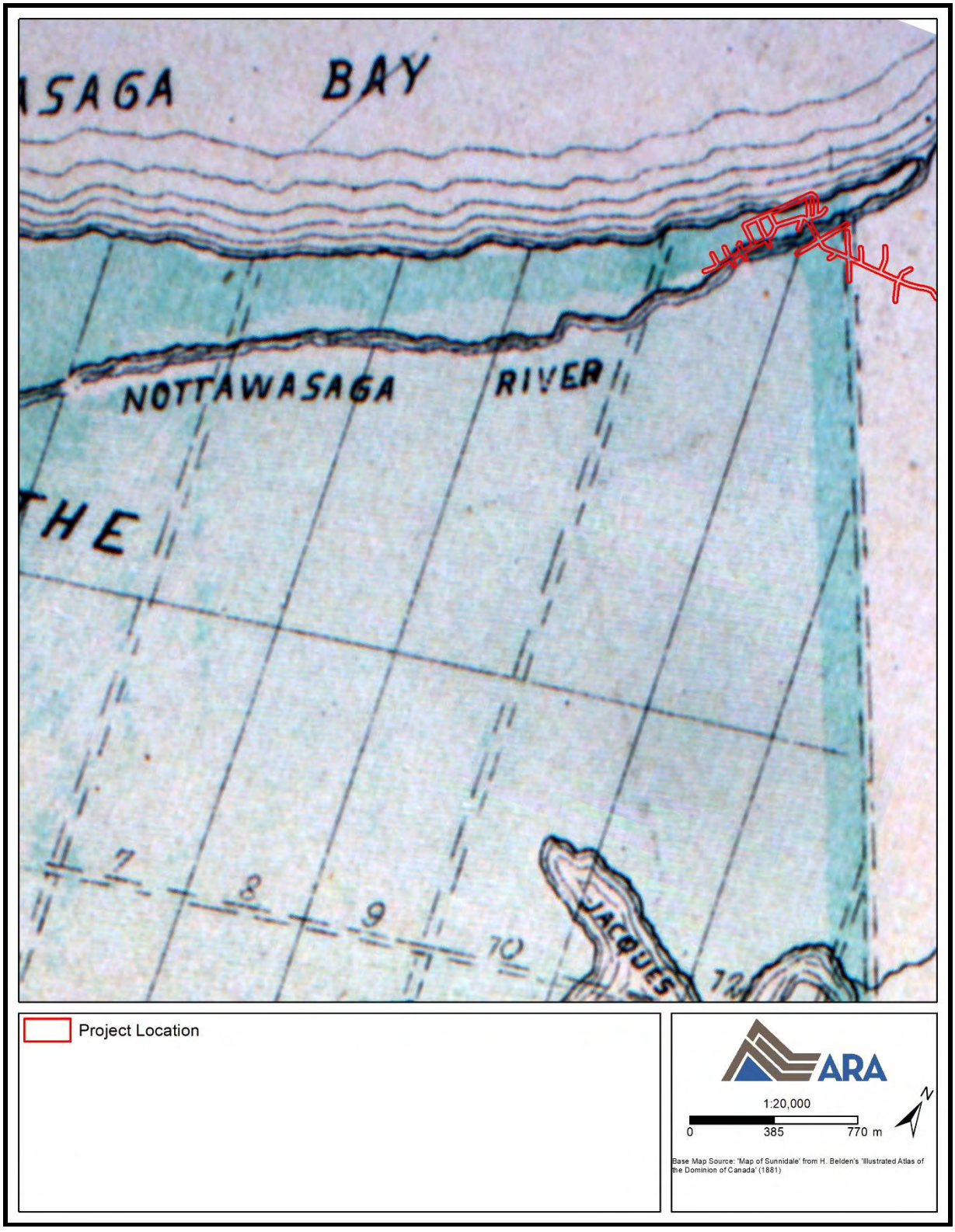
white or a variety of bright colours such as turquoise. The area surrounding the intersection of Mosley and Main Streets represents the commercial core of the Town with many retail establishments, restaurants, larger motels and parking lots lining the streets with limited setbacks so as to entice passing patrons.



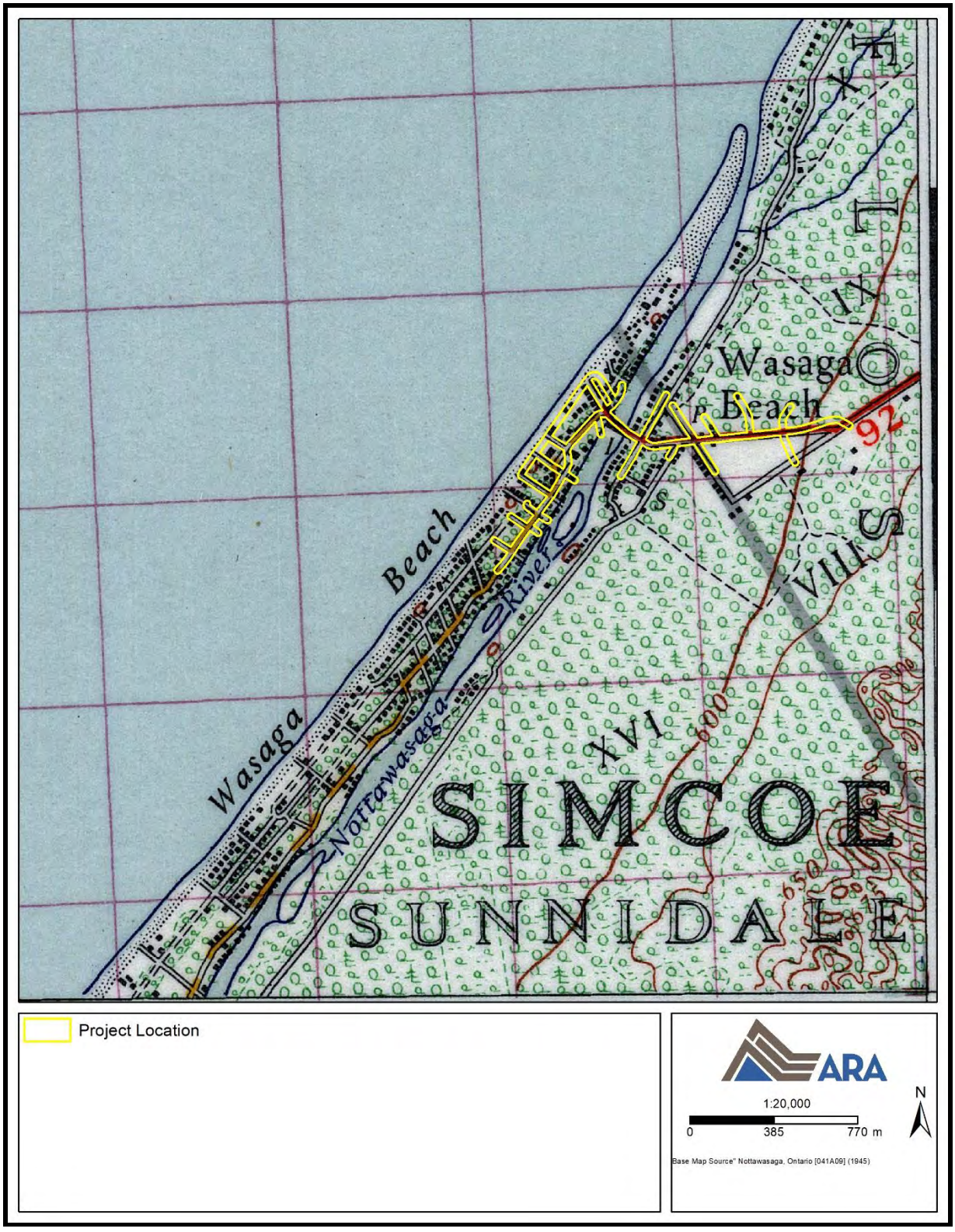
Map 2: Project Location Shown on the *Map of Nottawasaga and Sunnidale Townships* from J. Hogg's *Hogg's Map of the County of Simcoe (*1871)
(J. Hogg 1871)



Map 3: Project Location Shown on the *Map of Flos* from H. Belden's *Illustrated Historical Atlas of the Dominion of Canada* (1881)
(McGill University 2001)



Map 4: Project Location Shown on the *Map of Sunnidale Township* from H. Belden's *Illustrated Historical Atlas of the Dominion of Canada (*1881)
(McGill University 2001)



Map 5: Historic Topographic Map (1945) Showing the Project Location
(OCUL 2018)

4.0 HERITAGE CONTEXT

In order to determine whether any previously-identified properties with CHVI are located within the study area, ARA consulted a number of heritage groups and online heritage resources.

MHSTCI's current list of Heritage Conservation Districts was consulted. No designated districts were identified in the study area (MHSTCI 2019). The list of properties designated by the MHSTCI under Section 34.5 of the OHA was consulted. No properties in the study area are listed. The OHT plaque database were searched and none of the properties within the study area are commemorated with an OHT plaque. The Federal Canadian Heritage Database was searched and two plaques erected by the HSMBC commemorating historic events are located at 111 Mosley Street, within the study area:

- **Ayling and Reid Flight National Historic Event**
  Address: 111 Mosley Street, Wasaga Beach, Ontario
  Recognition Statute: *Historic Sites and Monuments Act* (R.S.C., 1985, c. H-4)
  Designation Date: 1949-05-30
  Other Name: Ayling and Reid Flight (Designation Name)
  Importance: First flight from mainland Canada to England; 1934

Figure 1: The Ayling and Reid Flight HSMBC Plaque
(Government of Canada 2019)

- **Nancy (vessel) National Historic Event**
  Address: 111 Mosley Street, Wasaga Beach, Ontario
  Recognition Statute: *Historic Sites and Monuments Act* (R.S.C., 1985, c. H-4)
  Designation Date: 1923-05-25
  Other Name: Nancy (vessel) (Designation Name)
  Importance: Burned by the Americans in 1814, on the Nottawasaga River, War of 1812

Figure 2: The Nancy HSMBC Plaque
(Government of Canada 2019)

The significance of the Ayling and Reid Flight National Historic Event has been incorporated into CHL 2 the Beach as the site of the event. The significance of the Nancy has been incorporated into CHL 5 Nottawasaga River (see Appendix A).

ARA staff contacted the Town of Wasaga Beach and the County of Simcoe via email on November 11, 2019. A response was received from the Town's Planners, the Director of Legislative Services & Clerk, and the Deputy Clerk on November 12, 2019 indicating that the only formally recognized cultural heritage resource located within the study area is Beck Square, located at the northwest corner of Mosley Street and 1st Street North. A weblink to the Town of Wasaga Beach's Heritage Registry was provided by the Town's Director of Legislative Services & Clerk. The Registry provided historic information related to Beck Square and indicated that it was designated under Part IV of the *Ontario Heritage Act* by By-Law #2007-60, passed on May 22, 2007.

The County of Simcoe responded on November 13, 2019 and did not have any additional information to provide regarding built heritage resources or cultural heritage landscapes in the

study area, however they did provide information related to archaeological potential and the County's first Archaeological Management Plan. ARA passed this information on to our Project Manager undertaking a Stage 1 Archaeological Assessment for the project in tandem with this CHAR.

As part of the EA process, public input is also sought from Public Information Centres (PIC). At these meetings additional potential cultural heritage resources may be identified.

A site visit was conducted on November 6, 2019 in order to photograph and document the study area, and to record any local features that could enhance ARA's understanding of their setting in the landscape and contribute to the cultural heritage evaluation process. The site visit was conducted from publicly accessible, non-private lands.

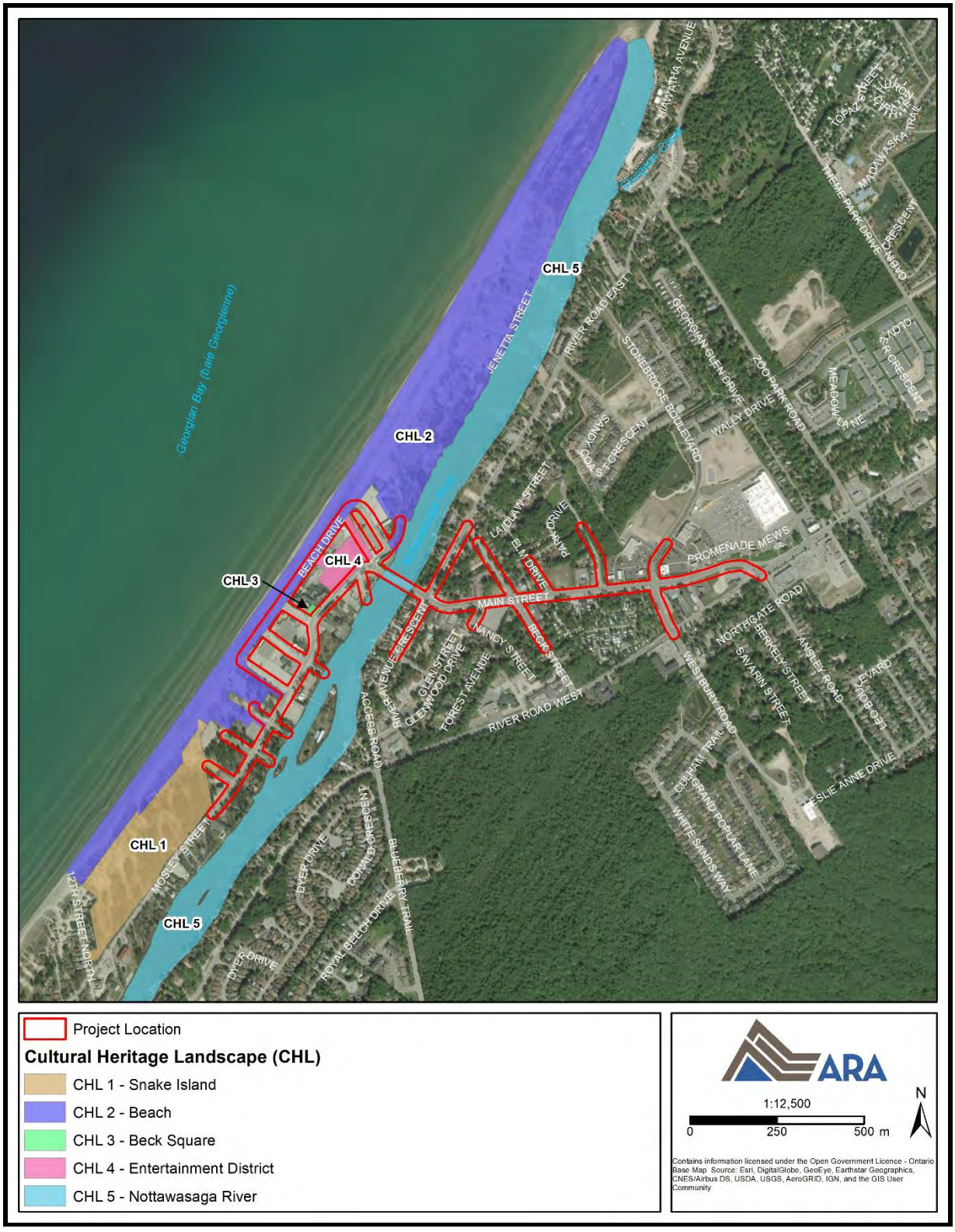
5.0 HERITAGE ASSESSMENT

The project location consists of Mosley Street from south of 6th Street North to Main Street, Beach Drive, and Main Street from Mosley Street to River Road West located in the Town of Wasaga Beach. The study area includes the road, the right of way and the adjacent property parcels. Mosley Street in this area of the town is a two-lane road with predominantly cottages and/or commercial buildings on either side. Main Street is a three- and four-lane road, primarily lined with motels and commercial buildings. The side streets included in the study area are largely lined with cottages and/or residences. As a result of consultation and field survey, the following BHRs were identified within the study area as having potential CHVI: 227 Mosley Street (BHR 1), 208 Mosley Street (BHR 2), 183 Mosley Street (BHR 3), 9 4th Street (BHR 4), 25 Main Street (BHR 5), 15 Willow Street (BHR 6), Main Street Bridge (BHR 7), 35 River Road East (BHR 8), 72 Main Street (BHR 9), 88 Main Street (BHR 10), 52 River Avenue Crescent (BHR 11), 44 Beck Street (BHR 12), 112 Beck Street (BHR 13), 116 Beck Street (BHR 14), 128 Beck Street (BHR 15), 136 Beck Street (BHR 16), 220 Main Street (BHR 17) and 10 Ansley Road (BHR 18). Five CHLs were also identified in the study area: Snake Island (CHL 1), the Beach (CHL 2), Beck Square (CHL 3), the Entertainment District (CHL 4) and the Nottawasaga River (CHL 5).

A summary of the results of the evaluation of the BHRs and CHLs against the criteria set out in O. Reg. 9/06 can be found in Table 3 and Table 4 and the information sheets with the evaluations for each heritage resource can be found in Appendix A.

The assessment determined that all 18 BHRs and five CHLs met one or more O. Reg. 9/06 criteria. Two cultural heritage resources, the Beach CHL (CHL 2) and Nottawasaga River (CHL 5) were identified to have the potential to meet criteria set out in O. Reg. 10/06. The evaluation of these resources are also included in the information sheets provided in Appendix A. The locations of BHR Nos. 1-18 and CHLs Nos. 1-5 appear in Map 6 and Map 7, respectively.

Map 6: BHR Assessment Results Map
(Produced by ARA under licence using ArcGIS® software by Esri, © Esri)



Map 7: CHL Assessment Results Map
(Produced by ARA under licence using ArcGIS® software by Esri, © Esri)

Table 3: BHRs and CHLs with CHVI

Type and Number	Address/Name	Adjacent/ Participating	CHVI (Y/N)	Criteria Met
BHR 1	227 Mosley Street	Adjacent	Yes	Contextual Value
BHR 2	208 Mosley Street/ Wasaga Beach Community Presbyterian Church	Adjacent	Yes	Design/Physical Value, Historical/ Associative Value, Contextual Value
BHR 3	183 Mosley Street/ Devlin Cottage Court	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 4	9 4th Street	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 5	25 Main Street/Surf's Up	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 6	15 Willow Street/ Wasaga Beach Yacht Club	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 7	Main Street Bridge	Participating	Yes	Design/Physical Value, Contextual Value
BHR 8	35 River Road East/ Summerhill Cottages & Cabins	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 9	72 Main Street/ Edgewater Cottages	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 10	88 Main Street/Saga Resort	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 11	52 River Avenue Crescent	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 12	44 Beck Street	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 13	112 Beck Street	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 14	116 Beck Street	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 15	128 Beck Street	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 16	136 Beck Street	Adjacent	Yes	Design/Physical Value, Contextual Value
BHR 17	220 Main Street	Adjacent	Yes	Design or Physical Value
BHR 18	10 Ansley Road	Adjacent	Yes	Design or Physical Value
CHL 1	Snake Island	Adjacent	Yes	Contextual Value
CHL 2	Beach	Participating	Yes	Design/Physical Value, Historical/ Associative Value, Contextual Value
CHL 3	Beck Square	Adjacent	Yes	Historical/Associative Value, Contextual Value
CHL 4	Entertainment District	Adjacent	Yes	Historical/Associative Value, Contextual Value
CHL 5	Nottawasaga River	Adjacent	Yes	Historical/Associative Value, Contextual Value

Table 4: BHR and CHL Value Statements and Heritage Attributes

Type and Number	Address/Name	Value Statement(s)	Heritage Attributes*
BHR 1	227 Mosley Street	Supports the tradition and character of cottage beach accommodations in the area.	Small one-storey frame cottage building; rectangular plan; front gable roof; white painted wood siding; square window and door openings; located on a large lot with mature trees; frontage along and views to the Nottawasaga River.
BHR 2	208 Mosley Street/ Wasaga Beach Community Presbyterian Church	Representative example of a rural front-gable, frame religious building; Associated with the Presbyterian community in Wasaga Beach since 1922 and the beach community, located adjacent to Snake Island with views to the beach and Georgian Bay; a landmark along Mosley Street.	One-storey frame building; rectangular plan; steeply pitched front gable roof; bell tower; square window openings; double entrance doors; landmark along Mosley Street; views to Snake Island, the beach and Georgian Bay.
BHR 3	183 Mosley Street/ Devlin Cottage Court	Representative example of a complex of small frame cottage buildings; Supports the tradition and character of cottage beach accommodations in the area.	Multiple one-storey frame cottage buildings, including one-room cabins; rectangular floor plans; front gable roofs; turquoise painted wood siding; square window/door openings; located on a treed lot.
BHR 4	9 4th Street	Representative example of a complex of frame cottage buildings; Supports the tradition and character of cottage beach accommodations in the area.	One-and-a-half storey frame cottage building clad in wood siding painted blue with a front gable roof with a square window opening in the peak, covered front porch, square window/door openings; small one-storey frame cottage buildings clad in wood siding painted blue with hip roofs, square window/door openings; located on a treed lot adjacent to the beach with views to the beach and Georgian Bay.
BHR 5	25 Main Street/Surf's Up	Representative example of a commercial building designed in the Modern style; Supports the commercial and recreational character of downtown Wasaga Beach.	One-storey Modern style commercial building; rectangular floor plan; flat roof; brown brick cladding; large plate glass windows recessed below overhanging eaves; angled main entrance with glass double-doors.
BHR 6	15 Willow Street/ Wasaga Beach Yacht Club	Representative example of a two-storey yacht club building; Supports the commercial and recreational character of Wasaga Beach.	Two-storey frame building; rectangular floor plan; side gable roof; gable projection with Palladian window; rectangular window openings; covered front porch supported by wood posts with decorative brackets; frontage on and views to the Nottawasaga River.

Type and Number	Address/Name	Value Statement(s)	Heritage Attributes*
BHR 7	Main Street Bridge	Representative example of a steel I-beam bridge; Location contributed to the creation of the main street area as it provided ease of access between the beach and cottages; Landmark in downtown Wasaga Beach.	Four-span steel I-beam bridge; concrete abutments and piers; concrete deck carries two lanes of traffic; open metal railings with concrete ends and balustrades; carries Main Street over the Nottawasaga River; provides panoramic views to the Nottawasaga River; a landmark in downtown Wasaga Beach.
BHR 8	35 River Road East/ Summerhill Cottages & Cabins	Representative example of a complex of small frame cottage buildings; Supports the tradition and character of cottage beach accommodations in the area.	Complex of one-storey single-room frame wood cabins; square floor plan; front gable roof; white painted wood siding; square window and door openings; located on a lot with mature trees and a narrow setback from River Road East.
BHR 9	72 Main Street/ Edgewater Cottages	Representative example of a complex of frame cottage buildings; Supports the tradition and character of cottage beach accommodations in the area.	Complex of one-storey frame wood cabins; rectangular floor plan; side gable and hip roofs; rectangular and square window openings; located with a narrow setback from River Avenue Crescent; frontage on and views to the Nottawasaga River.
BHR 10	88 Main Street	Representative example of a complex of small frame cottage buildings; Supports the tradition and character of cottage beach accommodations in the area.	Collection of small one-storey frame wood cabins located adjacent to River Avenue Crescent; rectangular floor plan; side gable roof; clad in wood siding; rectangular window openings; located on a lot with mature trees and a shallow setback from River Avenue Crescent.
BHR 11	52 River Avenue Crescent	Representative example of a one-storey frame cottage building; Supports the tradition and character of cottage beach accommodations and recreation in the area.	One-storey frame building; square floor plan; hip roof with overhanding eaves; rectangular window openings; located on a lot with mature coniferous trees; frontage on and views to the Nottawasaga River.
BHR 12	44 Beck Street	Unique collection of five similarly designed two-storey, two-bay frame structures; Supports the character of cottage beach accommodations and recreation in the area.	Collection of five similarly designed two-storey, two-bay frame structures; rectangular floor plan; front gable roof with overhanging eaves; clad in alternating blue or yellow siding; rectangular window openings; entrance door offset to right of façade.
BHR 13	112 Beck Street	Representative example of a one-storey frame cottage building; Supports the character of cottage beach accommodations and recreation in the area.	One-storey frame building; square floor plan; jerkinhead roof; stone chimney; rectangular window openings; centrally placed front entrance.

Type and Number	Address/Name	Value Statement(s)	Heritage Attributes*
BHR 14	116 Beck Street	Representative example of a one-storey frame cottage building; Supports the character of cottage beach accommodations and recreation in the area.	One-storey frame building; rectangular floor plan; jerkinhead roof oriented to the front; rectangular window openings.
BHR 15	128 Beck Street	Representative example of a one-and-a-half storey frame cottage building; Supports the character of cottage beach accommodations and recreation in the area.	One-and-a-half storey frame building; rectangular floor plan; side gable roof with a dormer window; rectangular window openings.
BHR 16	136 Beck Street	Representative example of a one-storey frame cottage building; Supports the character of cottage beach accommodations and recreation in the area.	One-storey frame building; square floor plan; combination roof; clad in wood siding; rectangular window openings.
BHR 17	220 Main Street	Representative example of a one-storey bungalow.	One-storey white painted stucco clad bungalow; rectangular floor plan; low hip roof with A-line projection; rectangular multi-pane windows; awnings; square offset entrance flanked by two rectangular lites; attached two-car garage.
BHR 18	10 Ansley Road	Representative example of a split-level residence.	One-and-a-half storey split-level white stucco house; rectangular floor plan; side gable roof and hip roof; red brick chimneys; split rail fence; hedges; mature trees.
CHL 1	Snake Island	Important in defining and supporting the beach and dune system along the Wasaga Beach shoreline; Snake Island is physically linked to the beach and dune system along the Wasaga Beach shoreline.	Sandy dunes; mature coniferous and deciduous trees; system of marked trails; picnicking spots; located adjacent to the beach; views to the beach and Georgian Bay.

Type and Number	Address/Name	Value Statement(s)	Heritage Attributes*
CHL 2	Beach	Unique example of a public beach with a road, store fronts and recreational amenities built along the shoreline in proximity to the beach; Site of Ayling and Reid Flight National Historic Event, the staring location of the first non-stop flight from the mainland of Canada to England; Natural landform and recreational amenity that has drawn tourists to Wasaga Beach and defined the character of the Town since 1900s; Composed of/situated along the longest freshwater beach in the world; historically represented tourist draw to Wasaga Beach; Landmark as a popular summer tourist destination.	Sandy beach; location within Wasaga Beach Provincial Park; sand dunes; mature shade trees; board walk and recreational trails; Beach Drive; street lights; storefronts; panoramic views of the shoreline beaches, Georgian Bay and the Niagara Escarpment across the bay; Ayling and Reid Flight National Historic Event plaque.
CHL 3	Beck Square	Named for Anthony Beck, Reeve of the First Council of the Village of Wasaga Beach, July 4, 1949; Includes memorial monument honouring contributions of past residents, contains artifacts and Millennium Capsule; Large spruce tree once site of Annual Christmas Tree Lighting Ceremony; Location of first municipal buildings, known historically as the centre of Town.	Memorial monument; artifacts; the Town's Millennium Capsule; wall mural; seating structures; trees; flower beds; shrubbery; large spruce tree.
CHL 4	Entertainment District	Directly associated with former Playland Park amusement area, a significant tourist destination in Wasaga Beach for 50 years; Potential to yield information that contributes to an understanding of the seasonal tourist culture in Wasaga Beach; Historically linked to former Playland Park amusement area; Gateway to Main Street area and beach.	Playland Parking Lot; location at Main and Mosley Streets in the historic commercial core of Wasaga Beach; entrance signage and series of planters; views to the beach; views to the surrounding recreational and commercial land uses in the core; Playland Park Amusement Area plaque.

Type and Number	Address/Name	Value Statement(s)	Heritage Attributes*
CHL 5	Nottawasaga River	Associated with the Nancy Island Historic Site that commemorates the War of 1812. The wreck of the British schooner, the H.M.S. Nancy, remains on Nancy Island; Important in defining the character of the area, supports recreational activities and seasonal cottages in Wasaga Beach; Physically and historically linked to surroundings. Van Vlack, the small settlement that would become Wasaga Beach, was bolstered by establishment of a sawmill on Nottawasaga River in the late-19th century. The logging industry played an important role in development of the area as the river served as a natural route for timbers to be transported to lumber mills; Visually linked to Wasaga Beach, providing sought after scenic panoramic views between both banks; Landmark in Wasaga Beach.	Canoe and kayak routes; panoramic views between both banks of the river; Nancy Island Historic Site and the Wasaga Beach visitor center; The Nancy National Historic Event plaque.

*Heritage attributes may include, but are not limited to, those listed in this table.

6.0 DEVELOPMENT PLAN

The proposed development includes the evaluation of the reconstruction of Main Street and the revitalization of the downtown through the EA process. A detailed project description was not made available at the time of writing this report, however, according to the Town of Wasaga Beach's *Request for Proposal RFP # PW2018-11*, "The goal of the EA Study is to implement and determine a common shared vision and design of the downtown streetscape and to create an aesthetically beautiful environment with the highest level of visual impact on streetscape elements to boost awareness, image character, confidence in the downtown revitalization efforts and to attract new business, investors, and the public. The downtown revitalization details are to be confirmed/consistent with the Downtown Development Master Plan and the Official Plan Amendment including Urban Design Guidelines established by the Town through 2017/2018. One of the main objectives from Council is to create a user-friendly street for all modes of transportation that will capitalize the walkability and pedestrian capacity of downtown to animate these streets and become a place-making destination…" (Town of Wasaga Beach 2018:5-6).

Among other tasks, the proposed work includes: the development of conceptual road cross-sections and streetscape visions; options for road/streetscape cross-sections; completion of a Detailed Analysis to identify impacts on the adjacent road network, including but not limited to, the intersections of Main Street/Beck Street, Beck Street/River Road East, River Road East/Main Street and Spruce Street/Mosley Street; and the provision of a list of viable streetscaping alternatives. Based on the information available at the time of writing, detailed designs or plans have not been prepared and the project location encompasses the potential areas of direct impact.

7.0 ANALYSIS OF POTENTIAL IMPACTS

Municipal road projects have the potential to affect cultural heritage resources. The former MCL's *InfoSheet #5: Heritage Impact Assessments and Conservation Plans* provides a list of potential impacts for evaluating against any proposed development (MCL 2006b:3). Outlined in Section 2.0, impacts can be classified as either direct or indirect. Direct impacts (those that physically affect the heritage resources themselves) include, but are not limited to: initial project staging, excavation/levelling operations, construction of access roads and renovations or repairs over the life of the project.

Indirect impacts include, but are not limited to: alterations that are not compatible with the historic fabric and appearance of the area, the creation of shadows that alter the appearance of an identified heritage attribute, the isolation of a heritage attribute from its surrounding environment, the obstruction of significant views and vistas, and other less-tangible impacts. As stated in Section 2.5, there may be positive environmental and cultural effects as a result of an EA undertaking.

This project entails both engineering services and a planning process for the reconstruction/ revitalization work and as such, there are not, as of yet, detailed designs available that would aid in the identification of project impacts. Therefore, the potential impacts and mitigation options related to the project will be discussed at a high level.
The heritage attributes of BHRs 1-6 and 8-18 or CHLs 1, and 3-5 will be directly impacted by the proposed project. Main Street Bridge (BHR 7) and the Beach (CHL 2) are within the study area

and may be impacted by the proposed reconstruction of Main Street and revitalization of downtown Wasaga Beach.

There may be some indirect impacts to the BHRs and CHLs during construction activities and minor changes to the character of the existing frontage of properties as a result of the reconstruction/revitalization-related activities. Some of these indirect impacts may in fact prove to be positive as the aesthetic of the streetscape is improved, opportunities to remove more recent infrastructure in order to restore original views to identified cultural heritage resources are identified, and/or efforts can be undertaken to interpret cultural heritage resources. In this case, the reconstruction of Main Street and downtown revitalization, particularly the possible installation of sidewalks, bike lanes, seating areas and/or transit stops, provides an opportunity for some of the identified cultural heritage resources to be interpreted (i.e., with plaques or public art, etc.).

8.0 RECOMMENDATIONS AND CONCLUSIONS

The project location consists of Mosley Street from south of 6th Street North to Main Street, Beach Drive, and Main Street from Mosley Street to River Road West located in the Town of Wasaga Beach. The study area includes the road, the right of way and the adjacent property parcels. Mosley Street in this area of Wasaga Beach is a two-lane road with predominantly cottages and/or commercial buildings located on either side. Main Street is a three and four-lane road primarily lined with motels and commercial buildings. The side streets included in the study area are largely lined with cottages and/or residences. As a result of consultation and field survey, the following BHRs were identified within the study area: 227 Mosley Street (BHR 1), 208 Mosley Street (BHR 2), 183 Mosley Street (BHR 3), 9 4th Street (BHR 4), 25 Main Street (BHR 5), 15 Willow Street (BHR 6), Main Street Bridge (BHR 7), 35 River Road East (BHR 8), 72 Main Street (BHR 9), 88 Main Street (BHR 10), 52 River Avenue Crescent (BHR 11), 44 Beck Street (BHR 12), 112 Beck Street (BHR 13), 116 Beck Street (BHR 14), 128 Beck Street (BHR 15), 136 Beck Street (BHR 16), 220 Main Street (BHR 17) and 10 Ansley Road (BHR 18). Five CHLs were also identified in the study area: Snake Island (CHL 1), the Beach (CHL 2), Beck Square (CHL 3), the Entertainment District (CHL 4) and the Nottawasaga River (CHL 5).

Detailed designs or plans for the reconstruction of Main Street and revitalization of downtown Wasaga Beach were not available at the time this report was written, however it is not anticipated that the heritage attributes of BHRs 1-6 and 8-18 or CHLs 1, and 3-5 will be directly impacted by the proposed project. Main Street Bridge (BHR 7) and the Beach (CHL 2) are within the study area and may be impacted by the proposed reconstruction of Main Street and revitalization of downtown Wasaga Beach. There may also be some indirect impacts to the identified resources during construction activities and minor changes to the character of the existing frontage of properties along Mosley and Main Streets due to the reconstruction/revitalization-related activities. Some of these indirect impacts may in fact prove to be positive as the aesthetic of the streetscape is improved, opportunities to remove more recent infrastructure in order to restore original views to identified cultural heritage resources are identified, and/or efforts can be undertaken to interpret cultural heritage resources (i.e., with plaques or public art).
As a result of this Cultural Heritage Assessment Report, the following mitigation strategies are recommended:

- That following the development of design alternatives, a Heritage Impact Assessment (HIA) should be prepared for the Beach CHL (CHL 2), a potential provincially significant heritage property, to ensure that its identified heritage attributes are not impacted as a result of reconstruction or revitalization work along Beach Drive. This study should be undertaken by a qualified heritage consultant.
- That following the development of design alternatives, a HIA should be prepared for Beck Square (CHL 3) to ensure that its identified heritage attributes are not impacted as a result of reconstruction or revitalization work along Mosley Street and 1st Street North. This study should be undertaken by a qualified heritage consultant.
- That as the Main Street Bridge (BHR 7) is over 40 years old, the MCEA system requires the completion of a Cultural Heritage Evaluation Report (CHER) should any future improvement work be planned for the bridge. If a CHER has not yet been completed for the bridge and work is planned as part of the Main Street Reconstruction and Downtown Revitalization EA, a CHER should be undertaken. A HIA may also be required. These studies should be undertaken by a qualified heritage consultant.
- That development and site alteration should be isolated from identified BHRs, CHLs and their heritage attributes. During the planning and design phases of the reconstruction/ revitalization of Main and Mosley Streets, care should be taken to avoid, where possible, the 18 BHRs and five CHLs.
- That should project-related activities be expected to impact any of the identified BHRs or CHLs noted in this report, a qualified heritage consultant should be contracted to complete property specific HIAs and provide detailed mitigation options to address the proposed work on the resources.
- That road reconstruction and revitalization, particularly the possible installation of sidewalks, bike lanes, seating areas and/or transit stops, may provide an opportunity to interpret some of the identified cultural heritage resources (i.e., with plaques, public art).
- That public consultation may result in additional potential cultural heritage resources being identified. These potential cultural heritage resources should be reviewed by a qualified heritage consultant to: 1) determine their cultural heritage value or interest, 2) evaluate potential project impacts, and 3) suggest strategies for future conservation of any identified cultural heritage resources.
- That should the reconstruction and revitalization activities or the project location expand beyond the scope examined in this report, a qualified heritage consultant should be retained to determine the potential impacts and suggest mitigation measures.
- That previously-unrecognized cultural heritage resources with cultural heritage value or interest discussed in this report *may* be worthy of inclusion on the Town of Wasaga Beach Heritage Registry.
- That this Cultural Heritage Assessment Report should be provided to staff/planners at the Town of Wasaga Beach and the County of Simcoe.

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Appendix A: Built Heritage Resources and Cultural Heritage Landscapes

BUILT HERITAGE RESOURCE NO. 1

DESCRIPTION OF PROPERTY	
Street Address	227 Mosley Street
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Commercial Recreational
Date(s)	Unknown
Description	• Small one-storey frame cottage building • Rectangular plan • Front gable roof • White painted wood siding • Projecting half-bay addition • Square window and door openings • Located on a large lot with mature trees and frontage along the Nottawasaga River (CHL 5) • Views to the Nottawasaga River
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method		
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or	Has direct associations with a theme, event, belief, person, activity, organization or		

Associative Value	institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the tradition and character of cottage beach accommodations in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: small one-storey frame cottage building; rectangular plan; front gable roof; white painted wood siding; square window and door openings; located on a large lot with mature trees; frontage along and views to the Nottawasaga River.

BUILT HERITAGE RESOURCE NO. 2

DESCRIPTION OF PROPERTY	
Street Address	208 Mosley Street
Name	Wasaga Beach Community Presbyterian Church
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Church
Date(s)	1964
Description	• One-storey frame building • Rectangular plan • Steeply pitched front gable roof • White stucco cladding • Bell tower • Square window openings • Double entrance doors • Covered front porch • Landmark along Mosley Street • Views to Snake Island (CHL 1) and the beach (CHL 2), including views to Georgian Bay A brief history of the church is noted on their website: "Wasaga Beach Community Presbyterian Church was established in 1997, however, the church building dates back to 1922. It was that year when the Wasaga Beach Community Church was erected near the mouth of the Nottawasaga River, opposite Nancy Island for summer services. Church services continued until the church Board purchased land and moved it to the present location at 6th and Mosley in the fall of 1964. In the spring of 1965, the church suffered a fire of unknown origin. Most of the building survived and the Board agreed to build new walls for the roof that was in good condition after the fire. Services resumed in the summer of 1966 and continued for another 30 years. It was in December 1995 that the Session of the First Presbyterian Church in Collingwood, asked the Presbytery of Barrie to explore the possibility of a new Presbyterian congregation in the fast-growing community of Wasaga Beach. A steering committee was named with the Rev. Wallace Little as convener. Negotiations began with the Board of the Wasaga Beach Community Church in the fall of 1996 and the spring of 1997. The Wasaga Beach Community Presbyterian Church was born, June 22, 1997. A renovation and winterizing project began in the fall of 1997. Fifty volunteers were encouraged to participate in the project supported by members of the Community Church Board who returned $50,000 of the purchase price needed to winterize the building. The congregation happily returned to the sanctuary for worship Sunday, December 21, 1997" (WBCPB 2013).

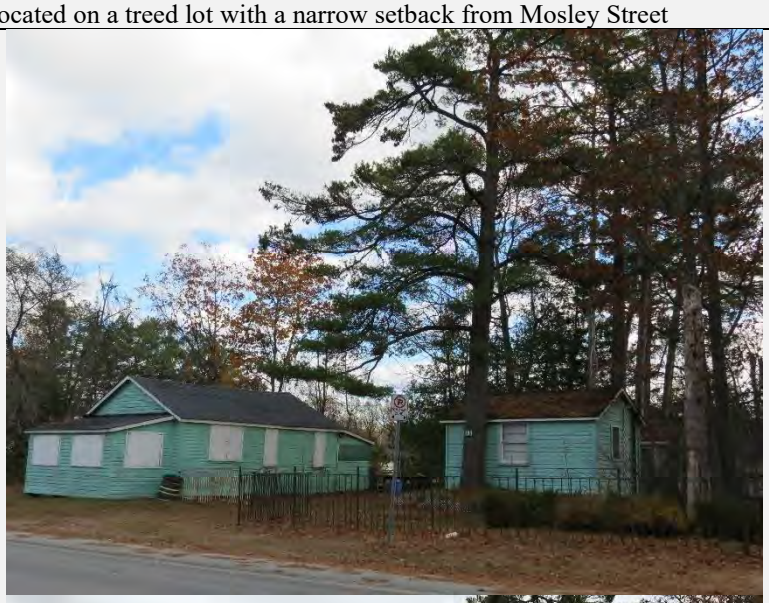
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a rural front-gable, frame religious building.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	✓	Associated with the Presbyterian community in Wasaga Beach since 1922.
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area		
	Is physically, functionally, visually or historically linked to its surroundings	✓	Associated with the beach community in Wasaga Beach, located adjacent to Snake Island with views to the beach and Georgian Bay.
	Is a landmark	✓	Is a landmark along Mosley Street.

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-storey frame building; rectangular plan; steeply pitched front gable roof; bell tower; square window openings; double entrance doors; landmark along Mosley Street; views to Snake Island, the beach and Georgian Bay.

REFERENCE MATERIALS	
Source	Wasaga Beach Community Presbyterian Church (WBCPC) 2013 *About Us.* Accessed online at: http://wasagapresbyterian.ca/about/.

BUILT HERITAGE RESOURCE NO. 3

DESCRIPTION OF PROPERTY	
Street Address	183 Mosley Street
Name	Devlin Cottage Court
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Commercial Recreational
Date(s)	Unknown
Description	• Multiple one-storey frame cottage buildings, including one-room cabins • Rectangular shaped floor plans • Front gable roofs • Turquoise painted wood siding • Square window and door openings • Located on a treed lot with a narrow setback from Mosley Street
Photographs	 
Date of Photos	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a complex of small frame cottage buildings.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the tradition and character of cottage beach accommodations in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: multiple one-storey frame cottage buildings, including one-room cabins; rectangular shaped floor plans; front gable roofs; turquoise painted wood siding; square window and door openings; located on a treed lot.

BUILT HERITAGE RESOURCE NO. 4

DESCRIPTION OF PROPERTY	
Street Address	9 4th Street
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Commercial Recreational
Date(s)	Unknown
Description	• One-and-a-half storey frame cottage building fronting 4th Street o Front gable roof with a square window opening in the peak o Clad in wood siding painted blue o Covered front porch spans façade o Square window and door openings • Small one-storey frame cottage buildings located behind larger cottage o Hip roofs o Clad in wood siding painted blue o Square window and door openings • Located on a treed lot adjacent to the beach (CHL 2) with views to the beach and Georgian Bay
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a complex of frame cottage buildings.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		

	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area		
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark	✓	Supports the tradition and character of cottage beach accommodations in the area.

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-and-a-half storey frame cottage building clad in wood siding painted blue with a front gable roof with a square window opening in the peak, covered front porch and square window and door openings; small one-storey frame cottage buildings clad in wood siding painted blue with hip roofs and square window and door openings; located on a treed lot adjacent to the beach with views to the beach and Georgian Bay.

BUILT HERITAGE RESOURCE NO. 5

DESCRIPTION OF PROPERTY	
Street Address	25 Main Street
Name	Surf's Up
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Commercial
Date(s)	Unknown
Description	• One-storey commercial building designed in the Modern style • Rectangular floor plan • Flat roof • Brown brick cladding • Large plate glass windows recessed below overhanging eaves • Angled main entrance with glass double-doors • Located adjacent to the Entertainment District (CHL 4) in downtown Wasaga Beach
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a commercial building designed in the Modern style.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		

	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the commercial and recreational character of downtown Wasaga Beach.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-storey commercial building designed in the Modern style; rectangular floor plan; flat roof; brown brick cladding; large plate glass windows recessed below overhanging eaves; angled main entrance with glass double-doors.

BUILT HERITAGE RESOURCE NO. 6

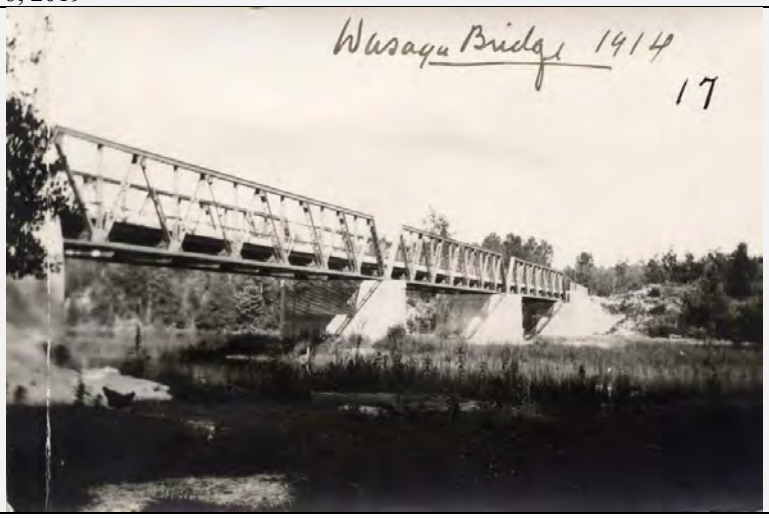
DESCRIPTION OF PROPERTY	
Street Address	15 Willow Street
Name	Wasaga Beach Yacht Club
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Recreational
Date(s)	Unknown
Description	• Two-storey frame building • Rectangular floor plan • Clad in white vinyl siding • Side gable roof • Gable projection with a Palladian window on the east elevation • Rectangular window openings • Shutters on the windows on the west elevation • Covered front porch supported by wood posts with decorative brackets • Projecting addition on the south elevation with a garage door entrance • Located on a triangular parcel of land surrounded by parking lots adjacent to the Main Street Bridge (BHR 7) with frontage on the Nottawasaga River (CHL 5) • Views to the Nottawasaga River
Photographs	 
Date of Photos	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a two-storey yacht club building.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the commercial and recreational character of Wasaga Beach.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: two-storey frame building; rectangular floor plan; side gable roof; gable projection with Palladian window; rectangular window openings; covered front porch supported by wood posts with decorative brackets; frontage on and views to the Nottawasaga River.

BUILT HERITAGE RESOURCE NO. 7

DESCRIPTION OF PROPERTY	
Location	Approximately 100 m north of River Road East, crossing the Nottawasaga River and comprising a section of Main Street at the entrance of Beach Areas 1 and 2.
Name	Main Street Bridge
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Bridge
Date(s)	1961
Description	• Four-span steel I-beam bridge • Concrete abutments and piers • Concrete deck carries two lanes of traffic • Open metal railings painted blue with concrete ends and balustrades • Carries Main Street over the Nottawasaga River (CHL 5) • Provides panoramic views to the Nottawasaga River • Is a landmark in downtown Wasaga Beach The following information was taken from "A bridge on the river Nottawasaga" in *Collingwood Today* (2018): • An original steel bridge was constructed in this location in 1909 to replace the Van Vlack Bridge, which was built in 1872 of wood • The steel bridge's location contributed to the creation of the main street area, as the beach was becoming very popular, and the bridge provided easy access • By the late 1950s, the steel bridge had deteriorated and was replaced by the current bridge in 1961, officially being opened on October 4 of that year • Some steel and concrete was saved and used to build a boathouse along the river

Photographs	 
Date of Photos	November 6, 2019
Archival Photograph	

	Archival image of the original Main Street steel bridge over the Nottawasaga River in Wasaga Beach in 1914 (Huron Institute No. 17, Collingwood Museum Collection X970.336.1)

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a steel I-beam bridge.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area		
	Is physically, functionally, visually or historically linked to its surroundings	✓	The bridge's location contributed to the creation of the main street area as it provided ease of access between the beach and cottages.
	Is a landmark	✓	The Main Street Bridge is a landmark in downtown Wasaga Beach.

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: four-span steel I-beam bridge; concrete abutments and piers; concrete deck carries two lanes of traffic; open metal railings with concrete ends and balustrades; carries Main Street over the Nottawasaga River; provides panoramic views to the Nottawasaga River; a landmark in downtown Wasaga Beach.

REFERENCE MATERIALS	
Sources	Collingwood Today 2018 "A bridge on the river Nottawasaga." Published in *Collingwood Today* on May 20, 2018 in "Remember This?" Accessed online at: www.collingwoodtoday.ca/remember-this/a-bridge-on-the-river-nottawasaga-929583. Town of Wasaga Beach 2019 *Staff Report, Main Street Bridge Rehabilitation, Contract No. PW2019-07, Tender Award Recommendation*. July 18, 2019. Accessed online at: https://wasagabeach.civicweb.net/document/10250/Main%20Street%20Bridge%20Tender%20Recommendation.pdf?handle=7CA7C8B33FC64F8EB21BC189EC629781. Watson, Mary 2013 *Sharing Memories: Stories of Wasaga's Past.* Orillia: Rose Printing.

BUILT HERITAGE RESOURCE NO. 8

DESCRIPTION OF PROPERTY	
Street Address	35 River Road East
Name	Summerhill Cottages & Cabins
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Commercial Recreational
Date(s)	Unknown
Description	• Complex of one-storey single-room frame wood cabins • Square floor plan • Front gable roof • White painted wood siding • Square window and door openings • Located on a lot with mature trees and a narrow setback from River Road East
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a complex of small frame cottage buildings.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		

	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the tradition and character of cottage beach accommodations in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: complex of one-storey single-room frame wood cabins; square floor plan; front gable roof; white painted wood siding; square window and door openings; located on a lot with mature trees and a narrow setback from River Road East.

BUILT HERITAGE RESOURCE NO. 9

DESCRIPTION OF PROPERTY	
Street Address	72 Main Street
Name	Edgewater Cottages
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Commercial Recreational
Date(s)	Unknown
Description	• Complex of one-storey frame wood cabins • Rectangular floor plan • Side gable and hip roofs • Clad in vinyl siding • Rectangular and square window openings • Concrete foundations • Located with a narrow setback from River Avenue Crescent and frontage on the Nottawasaga River (CHL 5) • Provides views to the Nottawasaga River
Photographs	 
Date of Photos	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a complex of frame cottage buildings.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the tradition and character of cottage beach accommodations in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: complex of one-storey frame wood cabins; rectangular floor plan; side gable and hip roofs; rectangular and square window openings; located with a narrow setback from River Avenue Crescent; frontage on and views to the Nottawasaga River.

BUILT HERITAGE RESOURCE NO. 10

DESCRIPTION OF PROPERTY	
Street Address	88 Main Street
Name	Saga Resort
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Commercial Recreational
Date(s)	Unknown
Description	• Complex of mini condos, motels and cottages • Collection of small one-storey frame wood cabins located adjacent to River Avenue Crescent • Rectangular floor plan • Side gable roof • Clad in wood siding • Rectangular window openings • Located on a lot with mature trees and a narrow setback from River Avenue Crescent
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a complex of small frame cottage buildings.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		

	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the tradition and character of cottage beach accommodations in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: collection of small one-storey frame wood cabins located adjacent to River Avenue Crescent; rectangular floor plan; side gable roof; clad in wood siding; rectangular window openings; located on a lot with mature trees and a shallow setback from River Avenue Crescent.

BUILT HERITAGE RESOURCE NO. 11

DESCRIPTION OF PROPERTY	
Street Address	52 River Avenue Crescent
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Residential
Date(s)	Unknown
Description	• One-storey frame building • Square floor plan • Concrete foundation • Hip roof with overhanding eaves • Clad in vinyl siding • Rectangular window openings • Located on a lot with mature coniferous trees and frontage on the Nottawasaga River (CHL 5) • Views to the Nottawasaga River
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a one-storey frame cottage building.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		

	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the tradition and character of cottage beach accommodations and recreation in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-storey frame building; square floor plan; hip roof with overhanding eaves; rectangular window openings; located on a lot with mature coniferous trees; frontage on and views to the Nottawasaga River.

BUILT HERITAGE RESOURCE NO. 12

DESCRIPTION OF PROPERTY	
Street Address	44 Beck Street
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Residential
Date(s)	Unknown
Description	• Collection of five similarly designed two-storey, two-bay frame structures • Rectangular floor plan • Concrete foundation • Front gable roof with overhanging eaves • Clad in alternating blue or yellow vinyl siding • Rectangular window openings with shutters on the second storey • Entrance door offset to the right of the façade • Set on the south side of an open grassed lot
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Unique collection of five similarly designed two-storey, two-bay frame structures.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		

	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the character of cottage beach accommodations and recreation in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: collection of five similarly designed two-storey, two-bay frame structures; rectangular floor plan; front gable roof with overhanging eaves; clad in alternating blue or yellow siding; rectangular window openings; entrance door offset to the right of the façade.

BUILT HERITAGE RESOURCE NO. 13

DESCRIPTION OF PROPERTY	
Street Address	112 Beck Street
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Residential
Date(s)	Unknown
Description	• One-storey frame building • Square floor plan • Concrete foundation • Jerkinhead roof oriented to the side • Clad in vinyl siding • Stone chimney • Rectangular window openings • Centrally placed front entrance • Projecting covered porch addition with a front gable
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a one-storey frame cottage building.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		

	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the character of cottage beach accommodations and recreation in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-storey frame building; square floor plan; jerkinhead roof; stone chimney; rectangular window openings; centrally placed front entrance.

BUILT HERITAGE RESOURCE NO. 14

DESCRIPTION OF PROPERTY	
Street Address	116 Beck Street
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Residential
Date(s)	Unknown
Description	• One-storey frame building • Rectangular floor plan • Concrete foundation • Jerkinhead roof oriented to the front • Octagonal ventilator in the peak of the jerkinhead roof • Clad in vinyl siding • Rectangular window openings • Projecting enclosed porch addition on the façade
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a one-storey frame cottage building.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		

	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the character of cottage beach accommodations and recreation in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-storey frame building; rectangular floor plan; jerkinhead roof oriented to the front; rectangular window openings.

BUILT HERITAGE RESOURCE NO. 15

DESCRIPTION OF PROPERTY	
Street Address	128 Beck Street
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Residential
Date(s)	Unknown
Description	• One-and-a-half storey frame building • Rectangular floor plan • Concrete foundation • Side gable roof with a dormer window • Clad in vinyl siding • Rectangular window openings • Enclosed three-bay front porch addition
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a one-and-a-half storey frame cottage building.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		

	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the character of cottage beach accommodations and recreation in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-and-a-half storey frame building; rectangular floor plan; side gable roof with a dormer window; rectangular window openings.

BUILT HERITAGE RESOURCE NO. 16

DESCRIPTION OF PROPERTY	
Street Address	136 Beck Street
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Residential
Date(s)	Unknown
Description	• One-storey frame building • Square floor plan • Combination roof • Clad in wood siding • Rectangular window openings
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a one-storey frame cottage building.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		

Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Supports the character of cottage beach accommodations and recreation in the area.
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-storey frame building; square floor plan; combination roof; clad in wood siding; rectangular window openings.

BUILT HERITAGE RESOURCE NO. 17

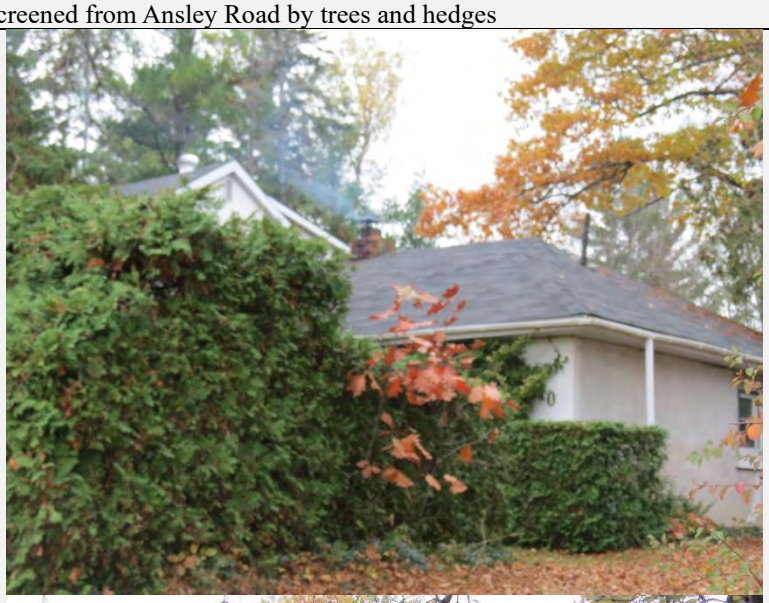
DESCRIPTION OF PROPERTY	
Street Address	220 Main Street
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Residential
Date(s)	Unknown
Description	• One-storey white painted stucco clad bungalow • Rectangular floor plan • Low hip roof with A-line projection • Rectangular multi-pane windows covered with awnings • Square offset entrance flanked by two rectangular lites to the right • Attached two-car garage
Photograph	
Date of Photo	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a one-storey bungalow.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		

	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area		
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-storey white painted stucco clad bungalow; rectangular floor plan; low hip roof with A-line projection; rectangular multi-pane windows covered with awnings; square offset entrance flanked by two rectangular lites to the right; attached two-car garage.

BUILT HERITAGE RESOURCE NO. 18

DESCRIPTION OF PROPERTY	
Street Address	10 Ansley Road
Name	n/a
Recognition	None
Location	Town of Wasaga Beach
Type of Property	Residential
Date(s)	Unknown
Description	• One-and-a-half storey split-level white stucco house • Rectangular floor plan • Side gable roof (one-and-a-half storey portion) and hip roof (one-storey portion) • Red brick chimneys • Split rail fence • Screened from Ansley Road by trees and hedges
Photographs	 
Date of Photos	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Representative example of a split-level residence.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area		
	Is physically, functionally, visually or historically linked to its surroundings		
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: one-and-a-half storey split-level white stucco house; rectangular floor plan; side gable roof (one-and-a-half storey portion) and hip roof (one-storey portion); red brick chimneys; split rail fence; hedges and mature trees.

CULTURAL HERITAGE LANDSCAPE NO. 1

DESCRIPTION OF PROPERTY	
Boundary	Bound by the beach, 6th Street North, Mosley Street and 12th Street North.
Name	Snake Island
Recognition	None
Location	Town of Wasaga Beach
Type of Landscape	Parks & Public Open Space
Description	• Landscape composed of sandy dunes, mature coniferous and deciduous trees, a system of marked trails, picnicking spots and views to the beach (CHL 2) and Georgian Bay • Snake Island is located adjacent to the beach • Likely named for the area's provision of critical habitat for snake species in the Wasaga Beach ecosystem
Photographs	 
Date of Photos	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method		
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community		
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	Important in defining and supporting the beach and dune system along the Wasaga Beach shoreline.
	Is physically, functionally, visually or historically linked to its surroundings	✓	Snake Island is physically linked to the beach and dune system along the Wasaga Beach shoreline.
	Is a landmark		

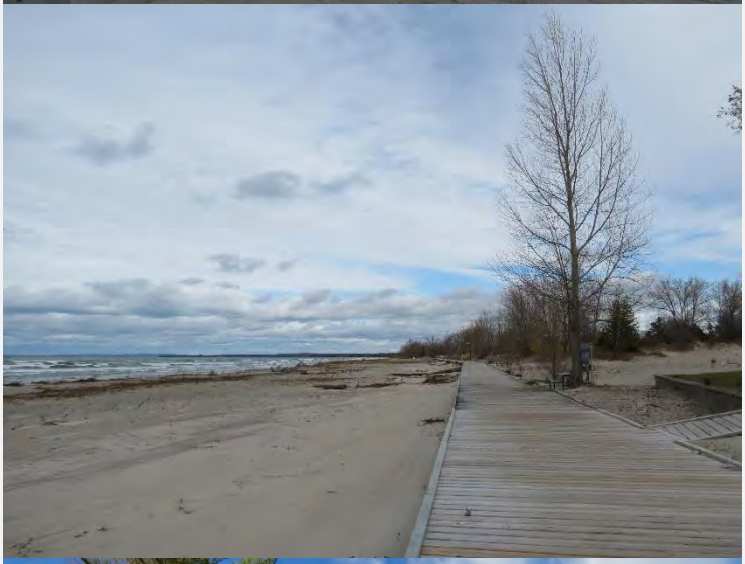
RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: sandy dunes; mature coniferous and deciduous trees; system of marked trails; picnicking spots; located adjacent to the beach; views to the beach and Georgian Bay.

CULTURAL HERITAGE LANDSCAPE NO. 2

DESCRIPTION OF PROPERTY	
Boundary	Bound by the mouth of the Nottawasaga River, Janetta Street, 12th Street North and Georgian Bay.
Name	Beach
Recognition	Historic Sites and Monuments Act (R.S.C., 1985, c. H-4) for the Ayling and Reid Flight National Historic Event plaque
Location	Town of Wasaga Beach
Type of Landscape	Beach

Description	• Sandy beach
	  o Portion of the longest freshwater beach in the world stretching 14 km (Ontario Parks 2019)
	• Located within a portion of Wasaga Beach Provincial Park
	  o Provides wildlife habitat for a variety of species including the endangered Piping Plover (Ontario Parks 2019)
	• Mature shade trees
	• Sand dunes
	• Board walk and recreational trails
	• Beach Drive
	• Street lights
	• Storefronts
	• Panoramic views of the shoreline beaches, Georgian Bay and the Niagara Escarpment across the bay
	
	The beach is the site of a National Historic Event, the Ayling and Reid Flight. This event has been commemorated with a plaque erected by the Historic Sites and Monuments Board of Canada that reads:
	
	“On 8 August 1934 J. R. Ayling and L. G. Reid, flying 'The Trail of the Caribou' a twin-engined biplane, the De Haviland 'Dragon', took off from the hard sands of Wasaga Beach headed for Baghdad. An icing problem led to a bent control rod and a throttle stuck wide open. This, in turn, increased fuel consumption by 70 per cent above that estimated and resulted in termination of the flight at Heston Airfield, London, England after 3,700 miles and 30 hours, 55 minutes of flying time. Despite failure in the main objective the aviators had accomplished the first non-stop flight from the mainland of Canada to England.”

Photographs	



Date of Photos	November 6, 2019

O. REG. 9/06 EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	✓	Is a unique example of a public beach with a road, store fronts and other recreational amenities built along the shoreline in close proximity to the beach.
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	✓	The beach is the site of a National Historic Event, the Ayling and Reid Flight, the staring location of the first non-stop flight from the mainland of Canada to England.
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	The beach is the natural landform and recreational amenity that has drawn tourists to Wasaga Beach during the summer months and defined the character of the Town since the 1900s.
	Is physically, functionally, visually or historically linked to its surroundings	✓	The landscape is composed of and situated along the longest freshwater beach in the world. The beach has historically represented the tourist draw to Wasaga Beach.
	Is a landmark	✓	The beach is a popular summer tourist destination in southern Ontario.

O. Reg. 10/06 Evaluation of CHVI of Provincial Significance		
Description	✓	**Value Statement**
The property represents or demonstrates a theme or pattern in Ontario's history.	✓	The beach is the site of a National Historic Event, the Ayling and Reid Flight, the staring location of the first non-stop flight from the mainland of Canada to England.
The property yields, or has the potential to yield, information that contributes to an understanding of Ontario's history.		
The property demonstrates an uncommon, rare or unique aspect of Ontario's cultural heritage.	✓	Wasaga Beach represents the longest freshwater beach in the world, stretching 14 km.
The property is of aesthetic, visual or contextual importance to the province.		
The property demonstrates a high degree of excellence or creative, technical or scientific achievement at a provincial level in a given period.		
The property has a strong or special association with the entire province or with a community that is found in more than one part of the province. The association exists for historic, social, or cultural reasons or because of traditional use.		

O. Reg. 10/06 Evaluation of CHVI of Provincial Significance		
Description	✓	**Value Statement**
The property has a strong or special association with the life or work of a person, group or organization of importance to the province or with an event of importance to the province.		
The property is located in unorganized territory and the Minister determines that there is a provincial interest in the protection of the property. O. Reg. 10/06, s. 1 (2).		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: sandy beach; location within Wasaga Beach Provincial Park; sand dunes; mature shade trees; board walk and recreational trails; Beach Drive; street lights; storefronts; panoramic views of the shoreline beaches, Georgian Bay and the Niagara Escarpment across the bay; the Ayling and Reid Flight National Historic Event plaque.

REFERENCE MATERIALS	
Sources	Government of Ontario 2019 Ayling and Reid Flight National Historic Event. Parks Canada Directory of Federal Heritage Designations. Accessed online at: www.pc.gc.ca/apps/dfhd/page_nhs_eng.aspx?id=1316. Ontario Parks 2019 Wasaga Beach. Accessed online at: www.ontarioparks.com/park/wasagabeach.

CULTURAL HERITAGE LANDSCAPE NO. 3

DESCRIPTION OF PROPERTY	
Boundary	Located on the northwest corner of Mosley Street and 1st Street North.
Name	Beck Square
Recognition	Part IV Designation, By-Law #2007-60, passed May 22, 2007
Location	Town of Wasaga Beach
Type of Landscape	Parks & Public Open Space
Description	The following information was adapted from Designation By-Law #2007-60: • Named after Anthony Beck, Reeve of the First Council of the Village of Wasaga Beach, July 4, 1949. • Beck Square was the location of the first municipal buildings and was known historically as the centre of Town. The Town hall was formerly located on these lands as well as the Police Station, the Chamber of Commerce, Post Office and some classes for the Wasaga Beach School were also held here in 1953-1954 and 1968. • After relocation of these and demolition of the buildings, the lands were dedicated to the Memory of Anthony Beck, the first Reeve. • Over the years the area fell into disrepair and was earmarked to become part of the existing parking lot. However, due to the site's historic value, it was designated as the Town's Millennium Project and a committee was formed to preserve the site and the square was rejuvenated. • Beck Square is now a Parkette that includes a memorial monument that honours the contributions of past residents, a wall mural, several other artifacts and the Town's Millennium Capsule. • Beck Square features commemorative plaques, seating structures, trees, flower beds, shrubbery and a large spruce tree that was once the site of the Town's Annual Christmas Tree Lighting Ceremony.
Photographs	

	
Date of Photos	November 6, 2019

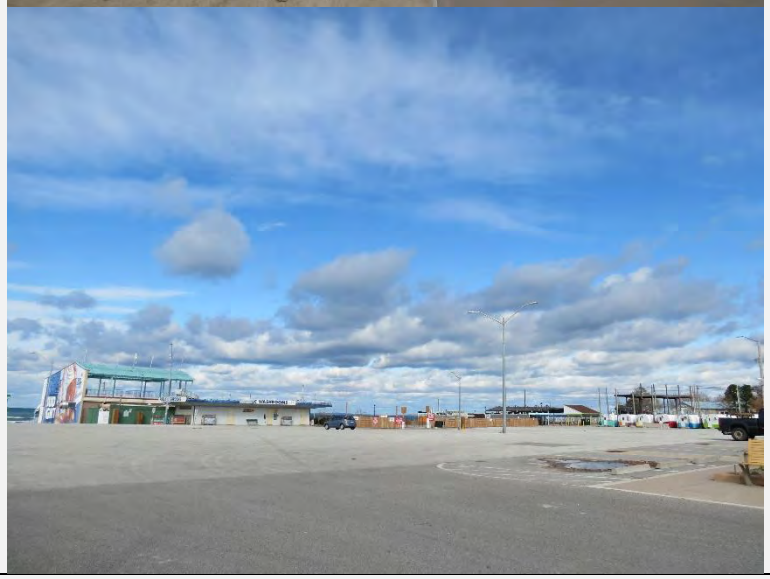
EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method		
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	✓	Beck Square is named after Anthony Beck, Reeve of the First Council of the Village of Wasaga Beach, July 4, 1949.
	Yields or has the potential to yield information that contributes to the understanding of a community or culture	✓	The Beck Square Parkette includes a memorial monument that honours the contributions of past residents and contains several artifacts and the Town's Millennium Capsule. It also contains a large spruce tree that was once the site of the Town's Annual Christmas Tree Lighting Ceremony.
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area		
	Is physically, functionally, visually or historically linked to its surroundings	✓	Beck Square was the location of the first municipal buildings and was known historically as the centre of Town. The Town hall was formerly located on these lands as well as the Police Station, the Chamber of Commerce, Post Office.
	Is a landmark		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: memorial monument; artifacts; the Town's Millennium Capsule; wall mural; seating structures; trees; flower beds; shrubbery; large spruce tree.

REFERENCE MATERIALS	
Sources	Ontario Heritage Trust (OHT) 2007 *Beck Square Designation By-Law #2007-60*. Accessed online at: www.heritagetrust.on.ca/en/oha/details/file?id=10180. Town of Wasaga Beach 2014 "Beck Square." *Town of Wasaga Beach Heritage Registry*. Accessed online at: **Error! Hyperlink reference not valid.**.

CULTURAL HERITAGE LANDSCAPE NO. 4

DESCRIPTION OF PROPERTY	
Boundary	Bound by Main Street, Mosley Street and Beach Drive.
Name	Entertainment District
Recognition	None
Location	Town of Wasaga Beach
Type of Landscape	Commercial
Description	The Entertainment District is located in the core of downtown Wasaga Beach and acts as a gateway to the beach. The landscape is composed of open space available for animation through recreational purposes, shops, and restaurants. The future of the area is being planned through The Town of Wasaga Beach Downtown Development Master Plan (2017). The Entertainment District has a significant history in Wasaga Beach, which has been described by the Friends of Nancy Island & Wasaga Beach Park as follows: "Wasaga Beach has a long history as a summer tourist destination. By the 1900s, railways and roads had improved and visitors had greater access to Wasaga Beach. Hotels and cottages began to appear along the river and a steel bridge was constructed in 1909 across the Nottawasaga River which increased access to the beachfront. While the roads had improved, the beach was still the primary transportation route for cars, horses, and bicycles. The resort community took off with the construction of the first hotel on the beach in 1912, the Capstan Inn. Though the original hotel burnt down in 1915, it was rebuilt and became an iconic landmark for the community. Not too long after, the Dardanella Dance Hall was built across from the Capstan Inn. Hotel guests would dress for dinner, then go to the dance hall for the evening. Over the next few decades several more hotels were built such as the Wasaga Inn, Breakers Hotel, Hiawatha Inn, and the Dyconia. The increased access and accommodations drew larger crowds to Wasaga Beach and by the 1930s larger establishments such as Playland Park [now the Entertainment District] began to appear. Playland Park was a permanent amusement area in Wasaga Beach from the 1930s to the early 1980s. It included a Ferris wheel, carousel, bowling alley, arcade, wild mouse roller coaster, and other various carnival rides. It became a staple in every tourists visit to Wasaga Beach. By the Second World War as many as 100,000 people would flock to Wasaga Beach on sunny weekends" (FNIWBP 2019). Playland Park, established in 1932 by William (Bull) Fielding, was located on the parking lot in this landscape. After Bull's death in 1954, ownership of the park passed through many hands until the property went to auction in the late 1980s. At this point demolition of the buildings took place and the property went on to operate as a parking lot for sever years until the Town purchased it and created Playland Parking Lot. Now known as Playland Park Square, amusement rides have operated here for a few weeks every summer since (Town of Wasaga Beach n.d.)

Photographs	 
Date of Photos	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method		
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	✓	Is directly associated with the former Playland Park amusement area, a significant tourist destination in Wasaga Beach for 50 years.
	Yields or has the potential to yield information that contributes to the understanding of a community or culture	✓	The landscape has the potential to yield information that contributes to an

			understanding of the seasonal tourist culture in Wasaga Beach.
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area		
	Is physically, functionally, visually or historically linked to its surroundings	✓	The landscape is historically linked to the former Playland Park amusement area, an historic tourist destination in Wasaga Beach.
	Is a landmark	✓	The Entertainment District is a gateway to the Main Street area and beach in Wasaga Beach.

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: Playland Parking Lot; location at Main and Mosley Streets in the historic commercial core of Wasaga Beach; entrance signage and series of planters; views to the beach; views to the surrounding recreational and commercial land uses in the core; Playland Park Amusement Area plaque.

REFERENCE MATERIALS	
Sources	Friends of Nancy Island & Wasaga Beach Park (FNIWBP) 2019 *Early Resort Community*. Accessed online at: www.wasagabeachpark.com/early-%20%20%20resort-community/. Town of Wasaga Beach n.d. *Playland Park Amusement Area*. Plaque.

CULTURAL HERITAGE LANDSCAPE NO. 5

DESCRIPTION OF PROPERTY	
Boundary	Nottawasaga River from its mouth at Georgian Bay to south of Nancy Island.
Name	Nottawasaga River
Recognition	Historic Sites and Monuments Act (R.S.C., 1985, c. H-4) for The Nancy National Historic Event plaque
Location	Town of Wasaga Beach
Type of Landscape	River
Description	The Nottawasaga River is a tributary of Lake Huron. It provides recreational and educational opportunities through game fishing and canoe and kayak routes, as well as panoramic views between both banks of the river. Many seasonal cottages line its banks in the Town of Wasaga Beach. The river is historically tied to the timber industry and subsequent settlement of the Wasaga Beach area. "Although unsuitable for farming, the Wasaga area had an abundance of trees. In the late 1830s, and throughout the rest of the century, the logging industry would play an important role in the development of the area. The Nottawasaga River served as a natural route for timbers to be transported to the lumber mills. There were several mills up the river and larger mills across the bay in Collingwood" (FNIWBP 2019). The river contains the Nancy Island Historic Site and the Wasaga Beach visitor center. The Friends of Nancy Island & Wasaga Beach Park describe that the island: "…has served as a historic site since 1928 and is the most viable site to the War of 1812 in Simcoe County and the Georgian Bay region. It represents a major event during the War of 1812: HMS Nancy's battle against three American schooners on August 14th of 1814. The island houses the charred hull and artefacts of the HMS Nancy from this pivotal moment in Canadian history. The borders of Canada today are a direct result of the valiant struggles of the Nancy and her crew. Gradually, the river currents deposited silt and sand about the sunken hull and an island was formed. On July 1, 1911, Mr. C.J.H. Snider located the hull, which was visible just beneath the water. It was not until August 1924, when an American 24-pounder round shot was found in the riverbank by Dr. F.J. Conboy that interest was renewed. The long-covered hull was rediscovered by Dr. Conboy, whose interest was spurred by Mr. Snider, during the summer of 1925. The Dominion and Provincial Governments, as well as many individuals, became interested in the historic site and in 1928 the hull was raised and placed on the island. On August 14, 1928, 114 years after the gallant defence of the Nancy, the Nancy museum was officially opened, on the island she helped to form, to commemorate this episode in the War of 1812" (2019). The National Historic Event related to the Nancy (vessel) and the War of 1812 has been commemorated with a plaque erected by the Historic Sites and Monuments Board of Canada that reads: "On the opposite bank stood a blockhouse built in August 1814 by Lieutenant Miller Worsley, R. N., to protect the NANCY, the only British ship remaining on Lake Huron. Worsley's small band of sailors and a few [First Nations] gallantly defended their posts against three enemy vessels, three companies of infantry, and numerous guns. The blockhouse was blown up and the NANCY burned to the waterline on 14 August. Worsley and his men escaped upriver, made their way to Michilimackinac in open boats, evading the American blockade, and afterwards captured the two blockading vessels."

Photographs	  
Date of Photos	November 6, 2019

EVALUATION OF PROPERTY			
Criteria	**Description**	✓	**Value Statement(s)**
Design or Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method		
	Displays a high degree of craftsmanship or artistic value		
	Displays a high degree of technical or scientific achievement		
Historical or Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	✓	Associated with the Nancy Island Historic Site that commemorates the War of 1812. The wreck of the British schooner, the H.M.S. Nancy, remains on Nancy Island.
	Yields or has the potential to yield information that contributes to the understanding of a community or culture		
	Demonstrates or reflects the work or ideas of an architect, builder, artist, designer or theorist who is significant to a community		
Contextual Value	Is important in defining, maintaining or supporting the character of an area	✓	The Nottawasaga River is important in defining the character of the area as it supports recreational activities and seasonal cottages in Wasaga Beach.
	Is physically, functionally, visually or historically linked to its surroundings	✓	The river is physically and historically linked to its surroundings. Van Vlack, the small settlement that would become Wasaga Beach, was bolstered by the establishment of a sawmill on the Nottawasaga River in the late-19th century. The logging industry played an important role in the development of the area as the river served as a natural route for timbers to be transported to lumber mills. The river is also visually linked to Wasaga Beach, providing sought after scenic panoramic views between both banks.
	Is a landmark	✓	The Nottawasaga River is a landmark in Wasaga Beach.

O. Reg. 10/06 Evaluation of CHVI of Provincial Significance		
Description	✓	**Value Statement**
The property represents or demonstrates a theme or pattern in Ontario's history.		
The property yields, or has the potential to yield, information that contributes to an understanding of Ontario's history.		
The property demonstrates an uncommon, rare or unique aspect of Ontario's cultural heritage.	✓	Associated with the Nancy Island Historic Site that commemorates the War of 1812. The wreck of the British schooner, the H.M.S. Nancy, remains on Nancy Island.
The property is of aesthetic, visual or contextual importance to the province.		
The property demonstrates a high degree of excellence or creative, technical or scientific achievement at a provincial level in a given period.		

O. Reg. 10/06 Evaluation of CHVI of Provincial Significance		
Description	**✓**	**Value Statement**
The property has a strong or special association with the entire province or with a community that is found in more than one part of the province. The association exists for historic, social, or cultural reasons or because of traditional use.		
The property has a strong or special association with the life or work of a person, group or organization of importance to the province or with an event of importance to the province.		
The property is located in unorganized territory and the Minister determines that there is a provincial interest in the protection of the property. O. Reg. 10/06, s. 1 (2).		

RESULTS OF HERITAGE ASSESSMENT	
CHVI Evaluation	Has CHVI.
Heritage Attributes	Key heritage attributes include: Canoe and kayak routes; panoramic views between both banks of the river; Nancy Island Historic Site and the Wasaga Beach visitor center; The Nancy National Historic Event plaque.

REFERENCE MATERIALS	
Sources	Government of Ontario 2019 Nancy (vessel) National Historic Event. Parks Canada Directory of Federal Heritage Designations. Accessed online at: www.pc.gc.ca/apps/dfhd/page_nhs_eng.aspx?id=1235. Friends of Nancy Island & Wasaga Beach Park (FNIWBP) 2019 Nancy Island Historic Site. Accessed online at: www.wasagabeachpark.com/nancy-island-historic-site/.

Appendix B: Team Member Curriculum Vitae

Paul J. Racher, MA, CAHP
Principal - Management and Senior Review (MSR) Team
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Biography

Paul Racher is a Principal of ARA. He has a BA in Prehistoric Archaeology from WLU and an MA in anthropology from McMaster University. He began his career as a heritage professional in 1986. Over the three decades since, he has overseen the completion of several hundred archaeological and cultural heritage contracts. Paul has years of experience related to linear transportation and rail projects, notably through the ongoing work to complete a Cultural Heritage Inventory for the Region of Waterloo's Stage 2 LRT from Kitchener to Cambridge, Ontario. He holds professional license #P007 with the MTCS. Paul is a former lecturer in Cultural Resource Management at WLU. He is a professional member of the Canadian Association of Heritage Professionals (CAHP) and the President of the Ontario Archaeological Association (OAS).

Education

1992-1997	PhD Programme, Department of Anthropology, University of Toronto. Supervisors: E.B. Banning and B. Schroeder. Withdrawn.
1989-1992	M.A., Department of Anthropology, McMaster University, Hamilton, Ontario. Thesis titled: "The Archaeologist's 'Indian': Narrativity and Representation in Archaeological Discourse."
1985-1989	Honours B.A., Wilfrid Laurier University, Waterloo, Ontario. Major: Prehistoric Archaeology.

Professional Memberships and Accreditations

Current	Ministry of Tourism Culture and Sport Professional Licence (#P007). Professional Member of the Canadian Association of Heritage Professionals (CAHP), Volunteer on the ethics committee. Member of the Ontario Archaeological Society (OAS), Volunteer on the Professional Committee. Associate of the Heritage Resources Centre, University of Waterloo. RAQS registered with MTO.

Work Experience

Current	**Vice-President, Operations, Archaeological Research Associates Ltd.** Responsible for winning contracts, client liaison, project excellence, and setting the policies and priorities for a multi-million dollar heritage consulting firm.
2000-2011	**Project Manager/Principal Investigator, Archaeological Research Associates Ltd.**

Managed projects for a heritage consulting firm. In 10 field seasons, managed hundreds of projects of varying size.

2008-2011 **Part-Time Faculty, Wilfrid Laurier University.**
Lecturer for Cultural Resource Management course (AR 336). In charge of all teaching, coursework, and student evaluations.

1995 **Field Archaeologist, University of Toronto.**
Served as a supervisor on a multinational archaeological project in northern Jordan.

1992-1995 **Teaching Assistant, University of Toronto.**
Responsible for teaching and organizing weekly tutorials for a number of courses.

1991-1994 **Part-Time Faculty, Wilfrid Laurier University.**
Lectured for several courses in anthropology. Held complete responsibility for all teaching, coursework, and student evaluations.

1992-1996 **Partner in Consulting Company, Cultural Management Associates Incorporated.**
Supervised several archaeological contracts in Southern Ontario. Participated in a major (now published) archaeological potential modeling project for MTO.

1989-1991 **Partner in Consulting Company, Cultural Resource Consultants.**
Managed the financial affairs of a consulting firm whilst supervising the completion of several contracts performed for heritage parks in central Ontario.

1988-1991 **Principal Investigator/Project Director, Archaeological Research Associates Ltd.**
Oversaw the completion of large contracts, wrote reports, and was responsible for ensuring that contracts were completed within budget.

1988 **Assistant Director of Excavations, St. Marie among the Hurons, Midland, Ontario.**
Duties included crew supervision, mapping, report writing and photography.

1986-1987 **Archaeological Crew Person, Archaeological Research Associates Ltd., Waterloo, Ontario.**
Participated in background research, survey, and excavation on a number of Archaeological sites across Ontario.

Kayla Jonas Galvin, MA, RPP, MCIP, CAHP
Heritage Operations Manager
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Biography

Kayla Jonas Galvin, Archaeological Research Associates Ltd.'s Heritage Operations Manager, has extensive experience evaluating cultural heritage resources and landscapes for private and public-sector clients to fulfil the requirements of provincial and municipal legislation such as the *Environmental Assessment Act*, the *Standards & Guidelines for the Conservation of Provincial Heritage Properties* and municipal Official Plans. She served as Team Lead on the Ministry of Tourism, Culture and Sport Historic Places Initiative, which drafted over 850 Statements of Significance and for *Heritage Districts Work!*, a study of 64 heritage conservation districts in Ontario. Kayla was an editor *of Arch, Truss and Beam: The Grand River Watershed Heritage Bridge Inventory* and has worked on Municipal Heritage Registers in several municipalities. Kayla has drafted over 150 designation reports and by-laws for the City of Kingston, the City of Burlington, the Town of Newmarket, Municipality of Chatham-Kent, City of Brampton and the Township of Whitchurch-Stouffville. Kayla is the Heritage Team Lead for ARA's roster assignments for Infrastructure Ontario and oversees evaluation of properties according to *Standards & Guidelines for the Conservation of Provincial Heritage Properties*. Kayla is a Registered Professional Planner (RPP), a Member of the Canadian Institute of Planners (MCIP), is a professional member of the Canadian Association of Heritage Professionals (CAHP) and sits on the board of the Ontario Association of Heritage Professionals.

Education

2016	MA in Planning, University of Waterloo. Thesis Topic: *Goderich – A Case Study of Conserving Cultural Heritage Resources in a Disaster*
2003-2008	Honours BES University of Waterloo, Waterloo, Ontario Joint Major: Environment and Resource Studies and Anthropology

Professional Memberships and Accreditations

Current	Registered Professional Planner (RPP) Member of the Canadian Institute of Planners (MCIP) Professional Member, Canadian Association of Heritage Professionals (CAHP) Board Member, Ontario Association of Heritage Professionals

Work Experience

Current	**Heritage Operations Manager, Archaeological Research Associates Ltd.** Oversees business development for the Heritage Department, coordinates completion of designation by-laws, Heritage Impact Assessments, Built Heritage and Cultural Heritage Landscape Assessments, and Cultural Heritage Resource Evaluations.

2009-2013 **Heritage Planner, Heritage Resources Centre, University of Waterloo**
Coordinated the completion of various contracts associated with built heritage including responding to grants, RFPs and initiating service proposals.

2008-2009, 2012 **Project Coordinator–Heritage Conservation District Study, ACO**
Coordinated the field research and authored reports for the study of 32 Heritage Conservation Districts in Ontario. Managed the efforts of over 84 volunteers, four staff and municipal planners from 23 communities.

2007-2008 **Team Lead, Historic Place Initiative, Ministry of Culture**
Liaised with Ministry of Culture Staff, Centre's Director and municipal heritage staff to draft over 850 Statements of Significance for properties to be nominated to the Canadian Register of Historic Places. Managed a team of four people.

Selected Professional Development

2019 OPPI and WeirFoulds Client Seminar: Bill 108 – More Homes, More Choice, 2019
2019 Annual attendance at Ontario Heritage Conference, Goderich, ON (Two-days)
2019 Information Session: Proposed Amendments to the OHA, by Ministry of Tourism, Culture and Sport
2018 Indigenous Canada Course, University of Alberta
2018 Volunteer Dig, Mohawk Institute
2018 Indigenizing Planning, three webinar series, Canadian Institute of Planners
2018 Cultural Heritage, Archaeology and Planning Symposium
2018 Transforming Public Apathy to Revitalize Engagement, Webinar, MetorQuest
2018 How to Plan for Communities: Listen to the Them, Webinar, CIP
2017 Empowering Indigenous Voices in Impact Assessments, Webinar, International Association for Impact Assessments
2017 Cultural Heritage, Archaeology and Planning Symposium
2017 Capitalizing on Heritage, National Trust Conference, Ottawa, ON.
2016 Cultural Heritage, Archaeology and Planning Symposium
2016 Heritage Rising, National Trust Conference, Hamilton
2016 Ontario Heritage Conference St. Marys and Stratford, ON.
2016 Heritage Inventories Workshop, City of Hamilton & ERA Architects
2015 Cultural Heritage, Archaeology and Planning Symposium
2015 City of Hamilton: Review of Existing Heritage Permit and Heritage Designation Process Workshop.
2015 Leadership Training for Managers Course, Dale Carnegie Training

Selected Publications

2018 "Conserving Cultural Heritage Landscapes in Waterloo: An Innovative Approach." *Ontario Association of Heritage Professionals Newsletter*, Winter 2018.
2018 "Restoring Pioneer Cemeteries" *Ontario Association of Heritage Professionals Newsletter.* Spring 2018. *In print.*
2015 "Written in Stone: Cemeteries as Heritage Resources." *Municipal World*, Sept. 2015.
2015 "Bringing History to Life." *Municipal World*, February 2015, pages 11-12.
2014 "Inventorying our History." *Ontario Planning Journal*, January/February 2015.
2014 "Assessing the success of Heritage Conservation Districts: Insights from Ontario Canada." with R. Shipley and J. Kovacs. *Cities*.

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Project Manager - Heritage
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Web: www.arch-research.com

Biography

Lindsay Benjamin is practiced at providing professional planning recommendations and expertise on complex studies, research projects, cultural heritage impact and archaeological assessments. Through her work as a Cultural Heritage Planner, Lindsay researched, drafted and implemented policies for the Regional Official Plan and other planning documents regarding the recognition, review and conservation of cultural heritage resources, including archaeological resources, heritage bridges, cultural heritage landscapes and scenic roads. She was the Primary Author of *Arch, Truss and Beam: The Grand River Watershed Heritage Bridge Inventory*, served as a Team Lead on the MTCS Historic Places Initiative that drafted over 850 Statements of Significance, and was Series Editor for Phase 2 of *Heritage Districts Work!* a study of 32 heritage districts in Ontario. Lindsay has developed cultural heritage landscape inventories, heritage property tax relief programs, worked on Municipal Heritage Registers and drafted designation by-laws in several municipalities. She holds a Master of Applied Environmental Studies degree from the University of Waterloo School of Planning, is a Registered Professional Planner (RPP), a Member of the Canadian Institute of Planners (MCIP) and is a professional member of the Canadian Association of Heritage Professionals (CAHP).

Education

2013	MAES, University of Waterloo, Waterloo, ON. Focus: Planning
2009	Post-Graduate Diploma, Centennial College, Toronto, ON Publishing & Professional Writing
2007	Honours BES, University of Waterloo, Waterloo, ON Major: Urban Planning, Co-op. Distinction: Dean's Honours List

Professional Memberships and Accreditations

Current	Registered Professional Planner (RPP) Member of the Canadian Institute of Planners (MCIP) Professional Member, Canadian Association of Heritage Professionals (CAHP)

Work Experience

2017-Present	**Project Manager - Heritage, Archaeological Research Associates Ltd.** Coordinate the completion of heritage projects, including the evaluation of the cultural heritage value or interest of a variety of cultural heritage resources.
2013-2017	**Cultural Heritage Planner, Region of Waterloo** Planned and implemented Arts, Culture and Heritage initiatives that support creativity and quality of life in the Region of Waterloo. Researched, developed and implemented Regional cultural heritage policies and programs. Fulfilled Regional

and Provincial cultural heritage and archaeological review responsibilities under the Planning Act and Ontario Heritage Act.

2009-2013 **Heritage Planner, Heritage Resources Centre, University of Waterloo**
Facilitate the completion of various cultural heritage contracts by undertaking archival research, site visits, report writing, liaising with municipal staff and stakeholders and coordinating project scheduling and budgetary responsibilities.

2006-2007 **Project Manager, Heritage Resources Centre, University of Waterloo**
Established the process of nominating heritage properties to the National Register of Historic Places. Primary liaison between all stakeholder groups, responsible for motivating each group to participate and provide funding. Drafted over 130 Statements of Significance for properties to be nominated to the National Register. Managed a team of five employees.

2005-2006 **Heritage Conservation Easement Planning Assistant, Ontario Heritage Trust**
Supported easement acquisitions through researching the historical and architectural value of potential acquisitions and extensive photo documentation. Screened and processed activity requests from property owners and stakeholders relating to the easement program. Conducted site visits to monitor conservation easement sites and prepared condition assessment reports.

Selected Professional Development

2019 OPPI and WeirFoulds Client Seminar: Bill 108 – More Homes, More Choice
2019 Annual attendance at Ontario Heritage Conference, Goderich, ON
2015-2019 Cultural Heritage, Archaeology and Planning Symposium
2018 How to Plan for Communities: Listen to the Them, Webinar, CIP
2013-2017 Ontario Heritage Planners Network Workshops
2017, 2016 National Trust for Canada Conference
2012 Heritage Impact Assessments Workshop, Region of Waterloo
2012 National Trust for Historic Preservation Conference, Spokane, WA
2012 Canadian Institute of Planners National Conference, Banff, ON

Selected Publications

2019 "Journey Through German Mills." *Waterloo Historical Society Annual Volume*. Volume 106 – 2018.
2018 "Conserving Cultural Heritage Landscapes in Waterloo: An Innovative Approach." *Ontario Association of Heritage Professionals Newsletter,* Winter 2018.
2017 Historic Interpretive Plaque - Village of German Mills
2016 Historic Interpretive Plaques - West Montrose Covered Bridge; Huron Road Bridge

Awards

2014 Heritage River Award, Watershed Awards & Canadian Heritage River Celebration, Grand River Conservation Authority
2009 A. K. (Alice King) Sculthorpe Award for Advocacy - ACO

Volunteer Experience

2017-2019 Lieutenant Governor's Ontario Heritage Awards Jury Member

Penny M. Young, MA, CAHP (#P092)
Project Manager - Heritage
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Biography

Penny Young has 27 years of cultural heritage management experience, 21 years working in government, as a Heritage Planner, Heritage Coordinator, Regional Archaeologist and Archaeological Database Coordinator where she managed and coordinated the impacts to cultural heritage resources including built heritage, archaeological sites and cultural heritage landscapes for compliance with municipal, provincial and federal legislation and policy. She has conducted results-driven and collaborative management of complex cultural heritage resource projects within the public sector involving developing project terms of reference, defining scope of work, preparation of budgets and conducting sites visits to monitor and provide heritage/archaeological and environmental advice and direction. At the Ministry of Transportation Penny revised, updated and developed policy, as part of a team, for the *Ontario Heritage Bridge Guidelines for Provincially Owned Bridge Guidelines for Provincially Owned Bridges*. She received the MTO Central Region Employee Recognition Award in 2001 and 2002. While at MTO she provided technical advice and input into the development of the *MTO Environmental Reference for Highway Design - Section 3.7 Built Heritage and Cultural Heritage Landscapes* and the *MTO Environmental Guide for Built Heritage and Cultural Heritage Landscapes.* She is a professional member of the Canadian Association of Heritage Planners (CAHP) and holds Professional License #P092 from MTCS. She also holds memberships in the Ontario Professional Planners Institute (OPPI) and the Ontario Archaeological Society (OAS).

Education

1990-1993 Master of Arts, Department of Anthropology McMaster University, Hamilton Ontario. Specializing in Mesoamerican and Ontario archaeology.

1983-1987 Honours Bachelor of Arts (English and Anthropology), McMaster University, Hamilton, Ontario.

Professional Memberships and Accreditations

Current Professional Member, Canadian Association of Heritage Professionals (CAHP)
Member of Ontario Archaeological Society
Pre-Candidate Member, Ontario Professional Planners Institute (OPPI)
Ministry of Tourism Culture & Sport Professional Licence (#P092)

Work Experience

Current **Project Manager - Heritage, Archaeological Research Associates Ltd.**
Coordinates ARA project teams and conducts heritage assessment projects including Heritage Impact Assessments, Built Heritage and Cultural Heritage Landscape Assessments, and Cultural Heritage Resource Evaluations. Additional responsibilities include the completion of designation by-laws and heritage

inventories. Liaises with municipal staff, provincial ministries and Indigenous communities to solicit relevant project information and to build relationships.

2008-2016 **Heritage Planner, Culture Services Unit, Ministry of Tourism, Culture & Sport (MTCS)**
Responsible for advising and providing technical review for management of cultural heritage resources in environmental assessment undertakings and planning projects affecting provincial ministries, municipalities, private sector proponents and Indigenous communities. Advised on municipalities' Official Plan (OP) policies cultural heritage conservation policies. Provided guidance on compliance with the Public Work Class EA, other Class EA legislation and 2010 *Standards and Guidelines for Provincial Heritage Properties*.

2014 **Senior Heritage Planner, Planning and Building Department, City of Burlington** (temporary assignment)
Project manager of the study for a potential Heritage Conservation District. Provided guidance to a multiple company consultant team and reported to municipal staff and the public. Liaised with Municipal Heritage Committee and municipal heritage property owners approved heritage permits and provided direction on Indigenous engagement, archaeological site assessments and proposed development projects.

2011 **Heritage Coordinator, Building, Planning and Design Department, City of Brampton** (temporary assignment)
Project lead for new Heritage Conservation District Study. The assignment included directing consultants, managing budgets, organizing a Public Information Session, and reporting to Senior Management and Council. Reviewed development/planning documents for impacts to heritage including OP policies, OP Amendments, Plans of subdivision and Committee of Adjustment applications and Municipal Class EA undertakings.

2010-2011 **Senior Heritage Coordinator, Culture Division, City of Mississauga** (temporary assignment)
Provided advice to Senior Management and Municipal Council on heritage conservation of built heritage, archaeological sites and cultural heritage landscapes. Liaised with multiple municipal staff including the Clerks' office, Parks and development planners and the public. Supervised and directed project work for junior heritage planner.

1999-2008 **Regional Archaeologist, Planning and Environmental Section, Ministry of Transportation (MTO)**
Responsibilities included: project management and coordination of MTO archaeology and heritage program, managed multiple consultants, conducted and coordinated field assessments, surveys and excavations, liaised with First Nations' communities and Band Councils, estimated budgets including $200,000 retainer contracts.

Sarah Clarke, BA
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Biography

Sarah Clarke is Archaeological Research Associates Ltd.'s Heritage Research Manager. Sarah has over 12 years of experience in Ontario archaeology and 10 years of experience with background research. Her experience includes conducting archival research (both local and remote), artifact cataloguing and processing, and fieldwork at various stages in both the consulting and research-based realms. As Team Lead of Research, Sarah is responsible for conducting archival research in advance of ARA's archaeological and heritage assessments. In this capacity, she performs Stage 1 archaeological assessment site visits, conducts preliminary built heritage and cultural heritage landscape investigations and liaises with heritage resource offices and local community resources in order to obtain and process data. Sarah has in-depth experience in conducting historic research following the *Ontario Heritage Toolkit* series, and the *Standards and Guidelines for Provincial Heritage Properties*. Sarah holds an Honours B.A. in North American Archaeology, with a Historical/Industrial Option from Wilfrid Laurier University and is currently enrolled in Western University's Intensive Applied Archaeology MA program. She is a member of the Ontario Archaeological Society (OAS), the Society for Industrial Archaeology, the Ontario Genealogical Society (OGS), the Canadian Archaeological Association, and is a Council-appointed citizen volunteer on the Brantford Municipal Heritage Committee. Sarah holds an R-level archaeological license with the MTCS (#R446).

Education

Current	MA Intensive Applied Archaeology, Western University, London, ON. Proposed thesis topic: Archaeological Management at the Mohawk Village.
1999–2010	Honours BA, Wilfrid Laurier University, Waterloo, Ontario Major: North American Archaeology, Historical/Industrial Option

Professional Memberships and Accreditations

Current	Member of the Ontario Archaeological Society
Current	Member of the Society for Industrial Archaeology
Current	Member of the Brant Historical Society
Current	Member of the Ontario Genealogical Society
Current	Member of the Canadian Archaeological Association
Current	Member of the Archives Association of Ontario

Work Experience

Current	**Team Lead – Research; Team Lead – Archaeology, Archaeological Research Associates Ltd.** Manage and plan the research needs for archaeological and heritage projects. Research at offsite locations including land registry offices, local libraries and local

and provincial archives. Historic analysis for archaeological and heritage projects. Field Director conducting Stage 1 assessments.

2013-2015 **Heritage Research Manager; Archaeological Monitoring Coordinator, Archaeological Research Associates Ltd.**
Stage 1 archaeological field assessments, research at local and distant archives at both the municipal and provincial levels, coordination of construction monitors for archaeological project locations.

2010-2013 **Historic Researcher, Timmins Martelle Heritage Consultants Inc.**
Report preparation, local and offsite research (libraries, archives); correspondence with the Ministry of Tourism, Culture, and Sport; report submission to the MTCS and clients; and administrative duties (PIF and Borden form completion and submission, data requests).

2008-2009 **Field Technician, Archaeological Assessments Ltd.**
Participated in field excavation and artifact processing.

2008-2009 **Teaching Assistant, Wilfrid Laurier University.**
Responsible for teaching and evaluating first year student lab work.

2007-2008 **Field and Lab Technician, Historic Horizons.**
Participated in excavations at Dundurn Castle and Auchmar in Hamilton, Ontario. Catalogued artifacts from excavations at Auchmar.

2006-2010 **Archaeological Field Technician/Supervisor, Wilfrid Laurier University.**
Field school student in 2006, returned as a field school teaching assistant in 2008 and 2010.

Professional Development

2019 Annual attendance at Ontario Heritage Conference, Goderich, ON
2018 Cultural Heritage, Archaeology and Planning Symposium
2018 Grand River Watershed 21st Annual Heritage Day Workshop & Celebration
2018 Mississaugas of the New Credit First Nation Historical Gathering and Conference
2017 Ontario Genealogical Society Conference
2016 Ontario Archaeological Society Symposium
2015 Introduction to Blacksmithing Workshop, Milton Historical Society
2015 Applied Research License Workshop, MTCS
2014 Applied Research License Workshop, MTCS
2014 Heritage Preservation and Structural Recording in Historical and Industrial Archaeology. Four-month course taken at Wilfrid Laurier University, Waterloo, ON. Professor: Meagan Brooks.

Presentations

2018 *The Early Black History of Brantford.* Brant Historical Society, City of Brantford.
2017 *Mush Hole Archaeology.* Ontario Archaeological Society Symposium, Brantford.
2017 *Urban Historical Archaeology: Exploring the Black Community in St. Catharines, Ontario.* Canadian Archaeological Association Conference, Gatineau, QC.

Volunteer Experience

Current Council-appointed citizen volunteer for the Brantford Municipal Heritage Committee.

Jacqueline McDermid, BA
Technical Writer
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Biography

Jacqueline recently finished a 6-month contract with MTO as the Heritage Specialist for Central Region, returning to her permanent position at ARA in the Fall 2018 where she had been the acting Heritage Team Lead for the year previous. As the lead, she directed the preparation and oversaw the submission of deliverables to clients. Currently, she is the Heritage Team Technical Writer and Researcher, where she continues to research and evaluate the significance of cultural heritage resources using *Ontario Regulation 9/06* and *10/06*, most recently completing designation reports for the City of Burlington, City of Kingston and Town of Newmarket and the Town of Whitchurch-Stouffville. Further, Jacqueline has overseen the completion of many Built Heritage and Cultural Heritage Landscape Studies as well as Heritage Impact Assessments including reports for a proposed aggregate pit, road widening, the LRT in the Region of Waterloo and a National Historic Site in St. Catharines. As well as being a proficient technical writer, Jacqueline is skilled at writing in approachable language demonstrated by my crafting of 30 properties stories and 35 thematic stories for Heritage Burlington's website. She holds an Honours Bachelor of Arts in Near Eastern Archaeology from Wilfrid Laurier University. In addition to heritage experience, Jacqueline also has archaeological experience working as field crew, as an Assistant Lab Technician and archaeological technical writer.

Education

2000-2007 Honours B.A., Wilfrid Laurier University, Waterloo, Ontario
Major: Near Eastern Archaeology

Work Experience

2015-Present **Technical Writer and Researcher – Heritage, Archaeological Research Associates Ltd., Kitchener, ON**
Research and draft designation by-laws, heritage inventories, Heritage Impact Assessments, Built Heritage and Cultural Heritage Landscape Assessments, and Cultural Heritage Resource Evaluations using Ontario Regulation 9/06, 10/06 and the Ontario Heritage Bridge Guidelines.

2018 **Environmental Planner – Heritage Ministry of Transportation, Central Region** – Six-month contract.
Responsibilities included: project management and coordination of MTO heritage program, managed multiple consultants, conducted and coordinated field assessments and surveys, estimated budgets including $750,000 retainer contracts. Provided advice on heritage-related MTO policy to Environmental Policy Office (EPO) and the bridge office.

2017-2018 **Acting Heritage Team Lead – Heritage Archaeological Research Associates Ltd., Kitchener, ON**
Managed a team of Heritage Specialists, oversaw the procurement of projects, retainers; managed all Heritage projects, ensured quality of all outgoing products.

2014-2015 **Technical Writer – Archaeology, Archaeological Research Associates Ltd., Kitchener, ON**
Report preparation; correspondence with the Ministry of Tourism, Culture, and Sport; report submission to the Ministry and clients; and administrative duties (PIF and Borden form completion).

2012-2013 **Lab Assistant, Archaeological Research Associates Ltd., Kitchener, ON**
Receive, process and register artifacts.

2011-2012 **Field Technician, Archaeological Research Associates Ltd., Kitchener, ON**
Participated in field excavation and artifact processing.

2005-2009 **Teaching Assistant, Wilfrid Laurier University, Waterloo, ON**
Responsible for teaching and evaluating first, second, third- and fourth-year student lab work, papers and exams.

2005-2007 **Lab Assistant, Wilfrid Laurier University – Near Eastern Lab, Waterloo, ON**
Clean, Process, Draw and Research artifacts from various sites in Jordan.

Selected Professional Development

2019 OPPI and WeirFoulds Client Seminar: Bill 108 – More Homes, More Choice
2019 Annual attendance at Ontario Heritage Conference, Goderich, ON (Two-days)
2019 Information Session: Proposed Amendments to the OHA, MTCS
2018 Indigenizing Planning, three webinar series, Canadian Institute of Planners
2018 Cultural Heritage, Archaeology and Planning Symposium
2018 Transforming Public Apathy to Revitalize Engagement, Webinar, MetorQuest
2018 How to Plan for Communities: Listen to the Them, Webinar, CIP
2017 Empowering Indigenous Voices in Impact Assessments, Webinar, International Association for Impact Assessments
2015 Introduction to Blacksmithing (One day)
2015 Leadership Training for Managers Course, Dale Carnegie Training

Appendix J:
Public Information Centre 1

Main Street Reconstruction
& Beach Area 1&2 Revitalization
Municipal Class Environmental Assessment Study
Notice of Public Information Centre

Background

The Town of Wasaga Beach is proposing improvements to the Main Street (River Road West to Mosley Street), Mosley Street (Main Street to 6th Street), Beach Drive and area corridors. The improvements are necessary to facilitate and support future growth within the study area and ensure that future transportation and infrastructure demands can be accommodated. As well as streetscaping options, the Environmental Assessment will identify various alternatives to implementing the needed improvements, with consideration given to road widening, intersection improvements, roundabouts and pedestrian and cycling facilities. Infrastructure improvements will also be considered in context of the Town's servicing strategy and associated infrastructure requirements.

Study Process

The Town is proceeding with a Schedule C Municipal Class Environmental Assessment (EA) to consider the impacts associated with the proposed improvements. The Class EA process will address the following:

- the existing operations and conditions along Main Street and through the beachfront area;
- alternative solutions to implementing the improvements and addressing the identified future needs;
- streetscaping alternatives;
- the location, extent and sensitivity of the existing environments within the area;
- the potential impacts of each alternative to the noted environments and possible mitigating measures;
- public and agency consultation and participation; and
- an assessment and evaluation of the alternatives culminating in a preferred solution.

Purpose of Notice

The purpose of this notice is to invite public/agency input via a Public Information Centre (PIC) to be held on Thursday February 6, 2020, from 7:00PM to 9:00PM at the Wasaga Beach RecPlex, Oakview Room, 1724 Mosley Street. The PIC will start with a presentation at 7:00 pm followed by an open house format. The purpose of the PIC is to present the study, the development and assessment of improvement options, and identify the recommended solution. Following completion of the PIC, and in consideration of concerns raised through agency reviews and public comment, the preferred solution will be identified for further study.

Project Contacts

Owner
Town of Wasaga Beach
30 Lewis Street
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Mike Latimer, C.E.T.
Project Coordinator
m.latimer@wasagabeach.com
(705) 429-2540 x2342

Consultant
Tatham Engineering Ltd.
200 Sandford Fleming Dr. #200
Collingwood, ON L9Y 5A6
Michael Cullip, P.Eng
Project Manager
mcullip@tathameng.com
(705) 444-2565 x2020

This notice issued January 23, 2020

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Agency	Ministry of the Environment, Conservation & Parks	Barrie District Office	54 Cedar Pointe Dr. Unit 1201	Barrie, Ontario	L4N 5R7	Cindy	Hood	Ms.	Manager	705-309-5874	cindy.hood@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Central Region Office	Place Nouveau 5775 Yonge Street, 9th Floor	Toronto, Ontario	M2M 4J1	Chunmei	Liu	Ms.	EA Coordinator	416-326-4886	chunmei.lui@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Environmental Assessment Services	135 St. Clair Ave. W. 1st Floor	Toronto, Ontario	M4V 1P5	Annamaria	Cross	Ms.	Manager	416-314-7967	Annamaria.cross@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Southwest Zone	1350 High Falls Road	Bracebridge	P1L 1W9	Meghan	Pomeroy	Ms.	Park Planner – Southwest Zone	705-646-5520	Meghan.Pomeroy@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Midhurst District Office	2284 Nursery Road	Midhurst, Ontario	L0L 1X0	Chantale	Gagnon	Ms.	Regional Advisor	705-241-2386	chantale.gagnon@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Heritage Planning Unit	401 Bay Street Suite 1701	Toronto, Ontario	M7A 0A7	Dan	Minkin	Mr.	Heritage Planner	416-314-7147	dan.minkin@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Archaeology Program Unit	401 Bay Street Suite 1700	Toronto, Ontario	M7A 0A7	Katherine	Cappella	Ms.	Manager	416-314-7132	katherine.cappella@ontario.ca
Agency	Ministry of Natural Resources & Forestry	Midhurst District	2284 Nursery Road	Midhurst, Ontario	L0L 1X0	Ken	Mott	Mr.	District Planner	705-725-7546	ken.mott@ontario.ca
Agency	Ministry of Natural Resources & Forestry	Wasaga Beach Provincial Park	11 22nd Street	Wasaga Beach, Ontario	L9Z 2V9	John	Fisher	Mr.	Park Superintendent		john.fisher@ontario.ca
Agency	Ministry of Municipal Affairs and Housing	Central Municipal Services Office	777 Bay Street 13th Floor	Toronto, Ontario	M5G 2E5	Aly	N. Alibhai	Mr.	Regional Director	416-585-7264	aly.alibhai@ontario.ca
Agency	Ministry of Agriculture, Food & Rural Affairs	OMAFRA Land-Use Policy & Stewardship	1 Stone Rd W. 3rd Floor	Guelph, Ontario	N1G 4Y2	John	Turvey	Mr.	Policy Advisor	519-766-8811	john.turvey@ontario.ca
Agency	Ministry of Transportation	Central Region, Planning & Design	159 Sir William Hearst Avenue, Bldg. “D”, 7th Floor	Toronto, Ontario	M3M 0B7	John	Mackinnon	Mr.	Area Manager	416-235-5533	john.mackinnon@ontario.ca
Agency	Ministry of Indigenous Affairs	Indigenous Relations Branch	160 Bloor Street E. Suite 400	Toronto, Ontario	M7A 2E6	Francois	Lachance	Mr.	Senior Advisor	416-326-4754	francois.lachance@ontario.ca

Last Updated: September 23, 2020

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Agency	Nottawasaga Valley Conservation Authority	John Hix Conservation Administration Centre	8195 8th Line	Utopia, Ontario	L0M 1T0	Doug	Hevenor	Mr.	Chief Administrative Officer	705-424-1479 ext. 225	dhevenor@nvca.on.ca
Agency	Lake Simcoe Region Conservation Authority		120 Bayview Parkway	Newmarket, Ontario	L3Y 3W3	Ben	Longstaff	Mr.	General Manager, Integrated Watershed Management	905-895-1281 ext. 305	b.longstaff@lsrca.on.ca
Agency	Simcoe Muskoka District Health Unit	15 Sperling Drive		Barrie, Ontario	L4M 6K9					705-721-7520	
Agency	Infrastructure Ontario	Realty Operations & Asset Management	1 Dundas Street West Suite 2000	Toronto, Ontario	M5G 1Z3	Sean	Wiley	Mr.	Executive Vice-President, Asset Management	416-327-3937	sean.wiley@infrastructureontario.ca
Agency	Infrastructure Ontario	Environmental Management				Cory	Ostrowka	Mr.			Cory.Ostrowka@infrastructureontario.ca
Agency (Federal)	Crown-Indigenous Relations & Northern Affairs Canada	Lands & Economic Development - Environment	655 Bay Street, Suite 700 8th Floor	Toronto, Ontario	M5G 2K4	Sunil	Bajaj	Mr.	Manager	416-973-4614	sunil.bajaj@canada.ca
Agency (Federal)	Department of Fisheries and Oceans	Fish & Fish Habitat Protection Program	867 Lakeshore Road	Burlington, Ontario	L7S 1A1	Tom	Hoggarth	Mr.	Regional Director, Ecosystems Management	905-336-4764	
Agency	Ontario Provincial Police	Huronia West Detachment	P.O. Box 140 1000 River Road West	Wasaga Beach, Ontario	L9Z 1A1						
Municipal	The County of Simcoe	Administration Centre	1110 Highway 26	Midhurst, Ontario	L9X 1N6	Mark	Aitkin	Mr.	Chief Administrative Officer	705-726-9300 ext.1260	cao@simcoe.ca
School Board	Simcoe County District School Board		1170 Highway 26	Midhurst, Ontario	L9X 1N6	Andrew	Keuken	Mr.	Manager of Planning, Enrolment & Community Use	705-734-6363 ext. 11513	akeuken@scdsb.on.ca
School Board	Simcoe Muskoka Catholic District School Board	46 Alliance Blvd.		Barrie, Ontario	L4M 5K3	Christine	Hyde	Ms.	Manager of Planning & Development	705-722-3555 ext. 351 (?)	chyde@smcdsb.on.ca
School Board	Simcoe County Student Transportation Consortium	64 Cedar Pointe Drive Suite 1403		Barrie, Ontario	L4N 5R7	Bonnie	Branch	Ms.	Transportation Coordinator	705-733-8965	bbranch@scstc.ca
Utility	Bell Canada	136 Bayfield Street	Floor 2	Barrie, Ontario	L4M 3B1	Andrew	Fournier	Mr.	Manager, Access Network	705-722-2677	andrew.fournier@bell.ca
Utility	Rogers Cable Systems	1 Sperling Drive	P.O. Box 8500	Barrie, Ontario	L4M 6B8	Tony	Dominguez	Mr.	Systems Planner	705-737-4660	tony.dominguez@rci.rogers.com

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Utility	Hydro One	Subdivision Group	420 Welham Road	Barrie, Ontario	L4N 8Z2	Heather	McTeer	Ms.			
Utility	Hydro One Network	45 Sarjeant Drive	P.O. Box 6700	Barrie, Ontario	L4M 5N5	Business Customer Centre					
Utility	Ontario Power Generation	700 University Avenue		Toronto, Ontario	M5G 1X6	Christopher F.	Ginther	Ms.	Chief Administrative Officer	416-592-2555	
Utility	Wasaga Distribution Inc.	P.O. Box 20	950 River Road West	Wasaga Beach, Ontario	L9Z 1A1						
Utility	Enbridge Gas Distribution Inc.	10 Churchill Dr.		Barrie, Ontario	L4N 8Z5	David	Smith	Mr.	Sales Development Representative	705-739-5254	
Utility	Union Gas	1590 8th Street East		Owen Sound, Ontario	N4K 0A2	Derrick	Cunningham	Mr.			
First Nations Community	Chippewas of Georgina Island	R. R. #2	P.O. Box N-13	Sutton West, ON	LOE 1RO	Donna	Big Canoe	Ms.	Chief	705 437-1337	
First Nations Community	Chippewas of Rama First Nation	5884 Rama Road	Suite 200	Rama, Ontario	L3V 6H6	Rodney	Noganosh		Chief	705-325-3611	
First Nations Community	Wahta Mohawk	P.O. Box 260	2664 Muskoka Road 38	Bala, Ontario	P0C 1A0	Philip	Franks		Chief	705-762-2354	
First Nations Community	Moose Dear Point	3719 Twelve Mile Bay Road	P.O. Box 119	Mac Tier, Ontario	P0C 1H0	Barron	King		Chief	705-375-5209	
First Nations Community	Wasauksing First Nation	P.O. Box 250	1508 Geewadin Road	Parry Sound, Ontario	P2A 2X4	Warren	Tabobondung		Chief	705-746-2531	
First Nations Community	Coordinator for Williams Treaties First Nation	8 Creswick Court		Barrie, Ontario	L4M 2J7	Karry	Sandy-McKenzie	Ms.	Barrister & Solicitor		inquiries@williamstreatiesfirstnations.ca
First Nations Community	Beausoleil First Nation (Christian Island)	11 O'Gemaa Miikaan		Christian Island, Ontario	L9M 0A9	Guy	Monague		Chief	705-247-2051	
First Nations Community	Georgian Bay Métis Council	355 Cranston Crescent	PO Box 4	Midland, Ontario	L4R 4K6	Greg	Garratt	Mr.	President	705-526-6335	greggarratt@gmail.com
First Nations Community	Moon River Métis Council		385a Bethune Drive North	Gravenhurst, Ontario	P1P 1B8	Tony	Muscat	Mr.	President		
First Nations Community	Métis Nation of Ontario - Head Office	66 Slater Street	Suite 1100	Ottawa, Ontario	K1P 5H1						

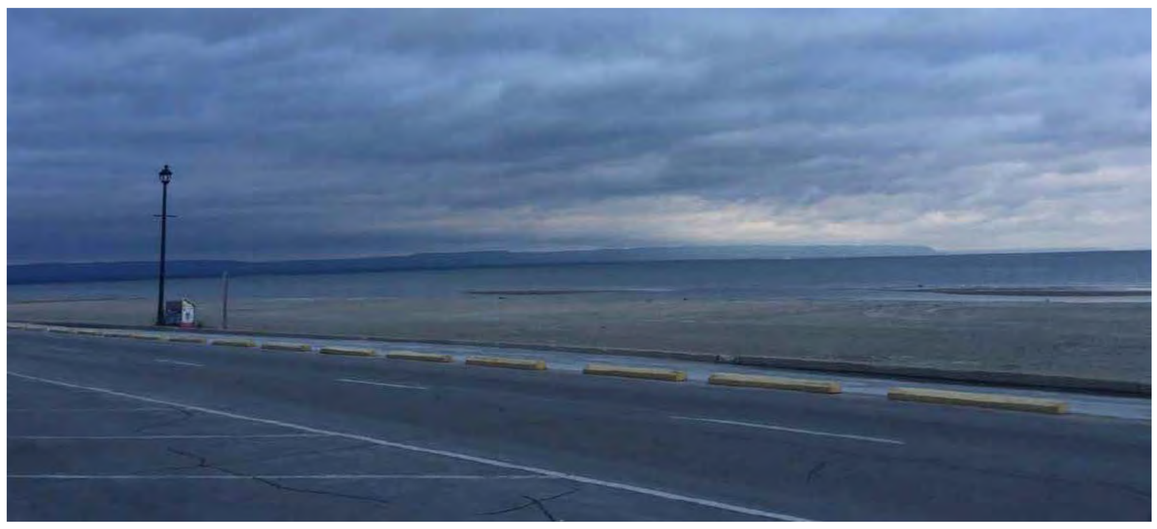
Last Updated: September 23, 2020

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
First Nations Community	La Nation Huronne-Wendat (Huron-Wendat First Nation)	Centre Administratif	255 Place Chef Michel Laveau	Wendake, Quebec	G0A 4V0	Konrad H.	Sioui		Grand Chief	418-843-3767	

Last Updated: September 23, 2020


Courtesy of Forrec Limited




Photos/pictures sourced from Urban Design Guidelines (WSP) & Downtown Development Master Plan (FORREC)

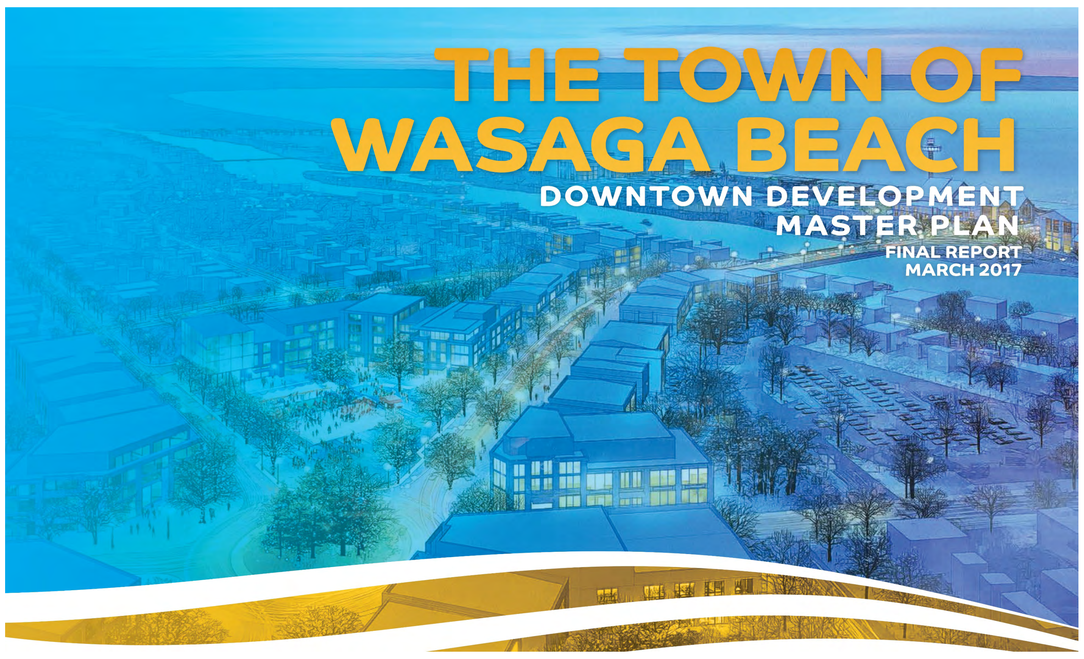
Main Street and Beach Areas 1 & 2 Improvements

PUBLIC INFORMATION CENTRE

BACKGROUND

Over the past several years, the Town has undertaken a number of initiatives relating to the redevelopment of Main Street and Beach Areas 1 & 2. The most significant to this project include:

- **Downtown Development Master Plan (DDMP)**
  - The DDMP was "*designed to promote the evolution of a livable, compact, accessible, sustainable downtown for the entire community .*"



- **Downtown Wasaga Beach Urban Design Guidelines (UDG)**
  - Intended to "*encourage development that supports and implements the objectives that are outlined in the DDMP.*"

OBJECTIVE OF THE STUDY

The objective of this study is to identify and facilitate the implementation of improvements to the study area transportation network in consideration of:

- the natural, socio-economic & heritage environments
- the needs of pedestrians
- the needs of cyclists
- the needs of motorists
- goals and objectives identified in the DDMP, UDG and supporting studies

PURPOSE OF THE STUDY

The purpose of this study is:

- develop alternative solutions to improve the local road network and renew infrastructure to facilitate the overall objectives of the DDMP and UDG
- identify the location, extent and sensitivity of affected environments
- assess the alternatives given potential environmental impacts
- identify the preferred solutions
- establish measures to mitigate impacts
- satisfy the Class EA requirements

PURPOSE OF THE PIC

The purpose of the Public Information Centre (PIC) is to:

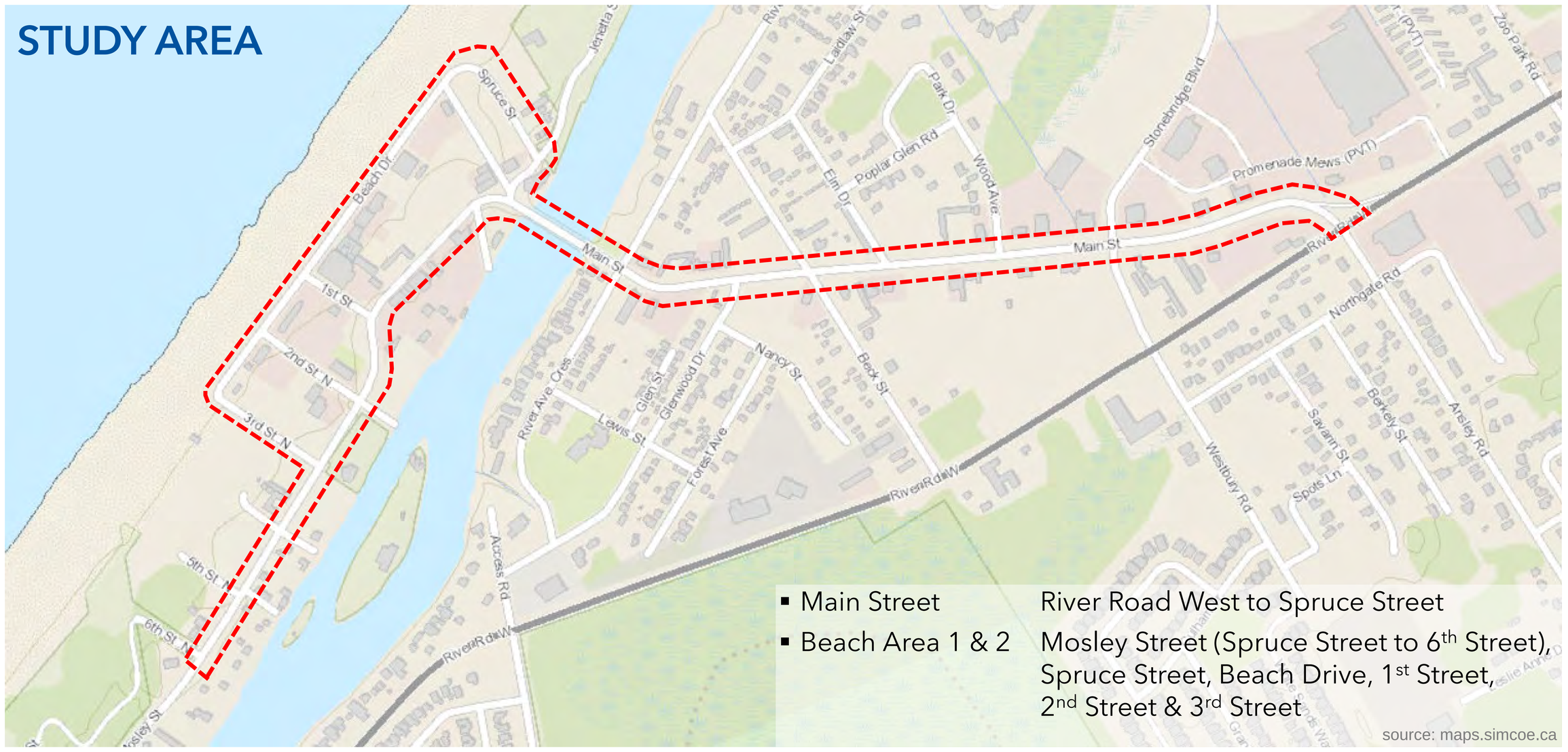
- establish channels of communication with public and stakeholders
- detail the study area, study purpose and objective
- present the need and justification for the study and issues to be resolved
- identify alternative solutions and potential environmental impacts
- seek input and comments for consideration in the selection of the preferred solutions

THE ROLE OF THE PUBLIC

To assist in the completion of this study, the public and stakeholders should:

- sign the registry
- review the presentation material
- ask questions of the Town and/or Consultant
- make your opinions known
- submit a comment sheet
- indicate whether you want to be added to the mailing list to be kept informed of the process and future events

STUDY AREA

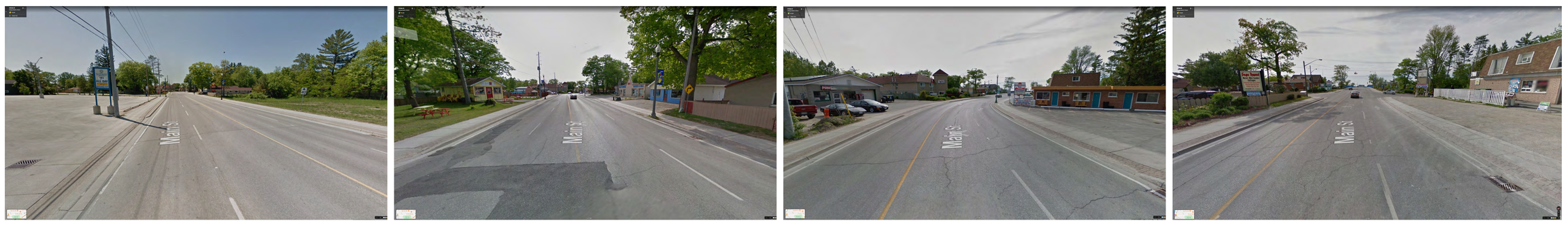


- Main Street — River Road West to Spruce Street
- Beach Area 1 & 2 — Mosley Street (Spruce Street to 6th Street), Spruce Street, Beach Drive, 1st Street, 2nd Street & 3rd Street

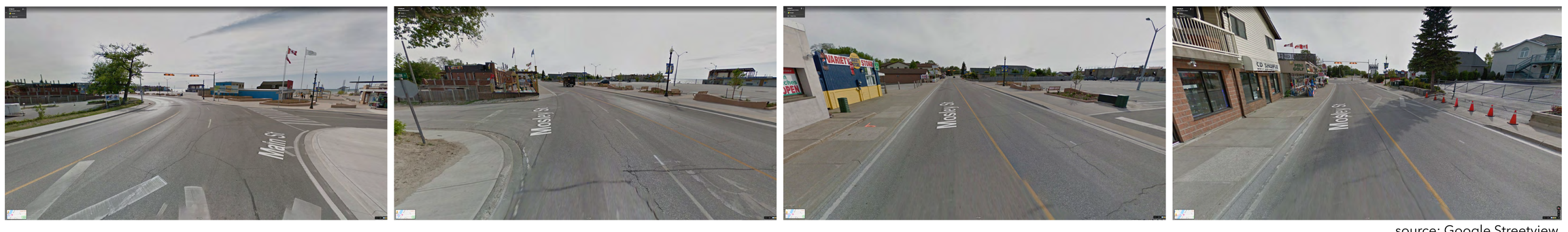
source: maps.simcoe.ca

MAIN STREET – River Road West to Stonebridge Boulevard

MAIN STREET – Stonebridge Boulevard to Beck Street



MAIN STREET – Beck Street to River Avenue Crescent / River Road East



MOSLEY STREET – Spruce Street to 1st Street

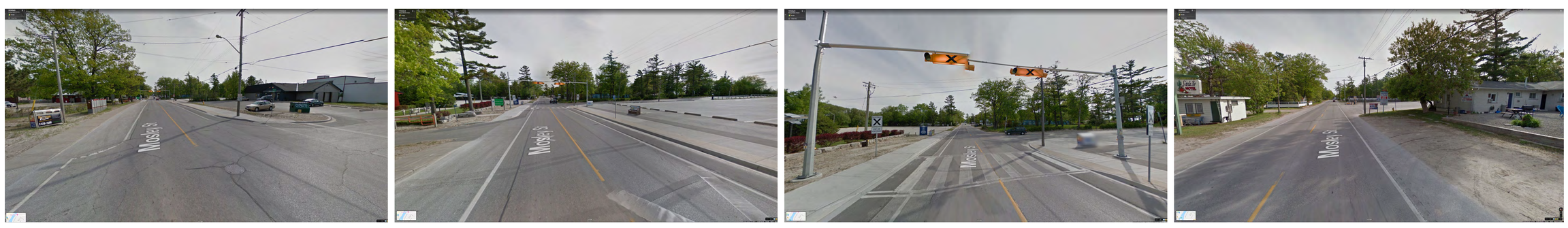
source: Google Streetview

Main Street and Beach Areas 1 & 2 Improvements

EXISTING CONDITIONS

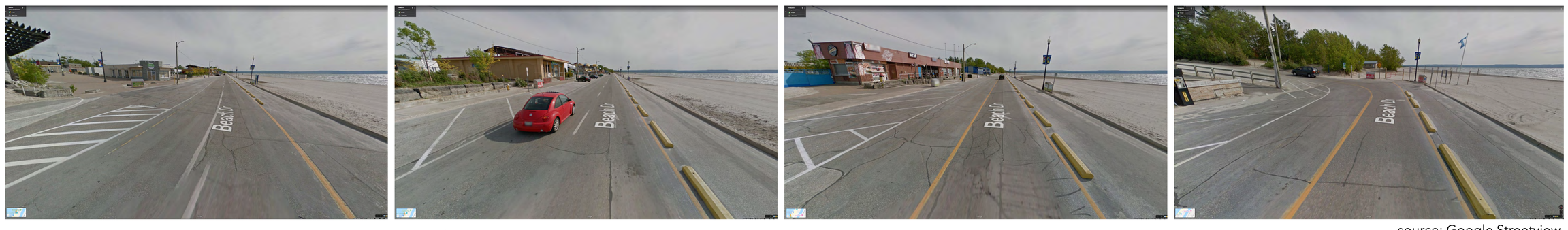
AERIAL MAPPING

MOSLEY STREET – 1st Street to 2nd Street



MOSLEY STREET – 2nd Street to 3rd Street

MOSLEY STREET – 3rd Street to 6th Street



BEACH DRIVE – Spruce Street to 3rd Street

source: Google Streetview

Main Street and Beach Areas 1 & 2 Improvements

EXISTING CONDITIONS

RIGHT-OF-WAY & PROPERTY LINES

source: Simcoe Maps

RIGHT-OF-WAY & PROPERTY LINES

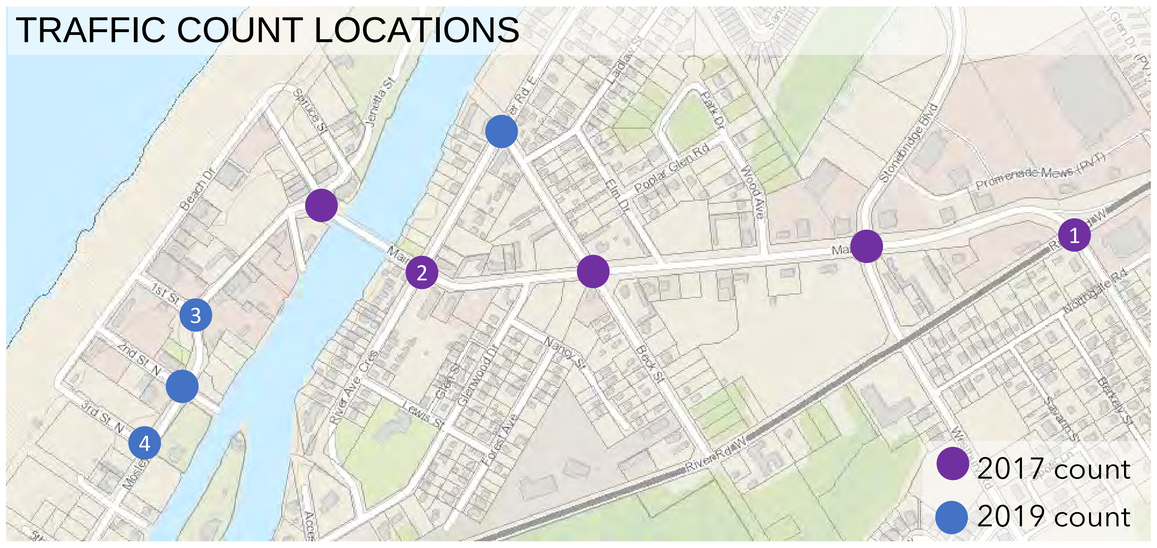
source: Simcoe Maps

Main Street and Beach Areas 1 & 2 Improvements

EXISTING CONDITIONS

TRAFFIC COUNTS

- Traffic counts were completed at key intersections along Main Street and Mosley Street on a weekday in June 2017 and June 2019.
- June is considered representative of **average conditions**.
- Traffic counts were also completed on Main Street and Mosley Street over the Canada Day weekend (June 30 to July 3, 2017).
- The Canada Day long weekend is considered a **peak summer weekend**.

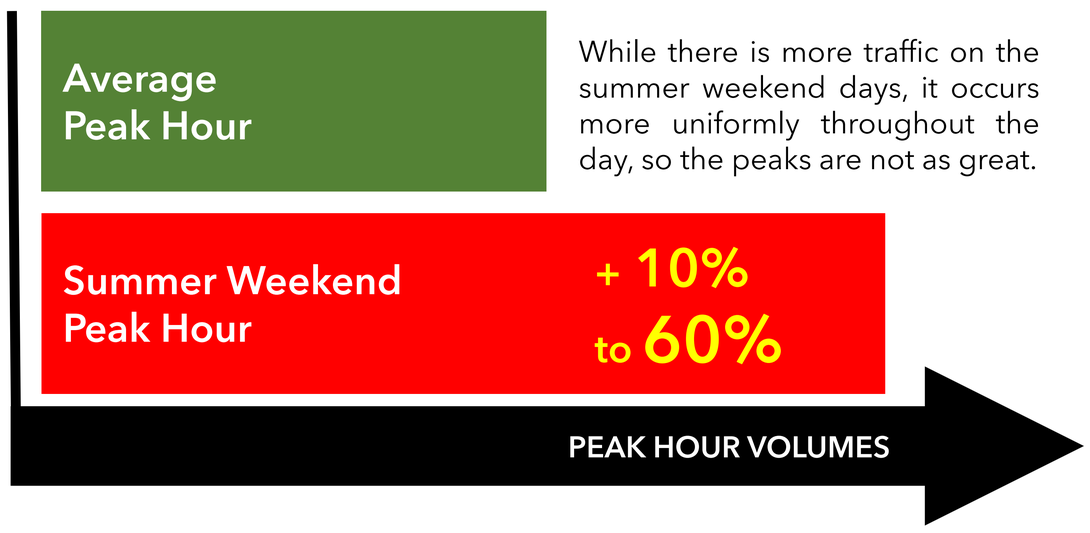


AVERAGE VS SUMMER DAILY

- The summer weekend daily volumes are in the order of 60 to 100% greater than the average daily volumes.

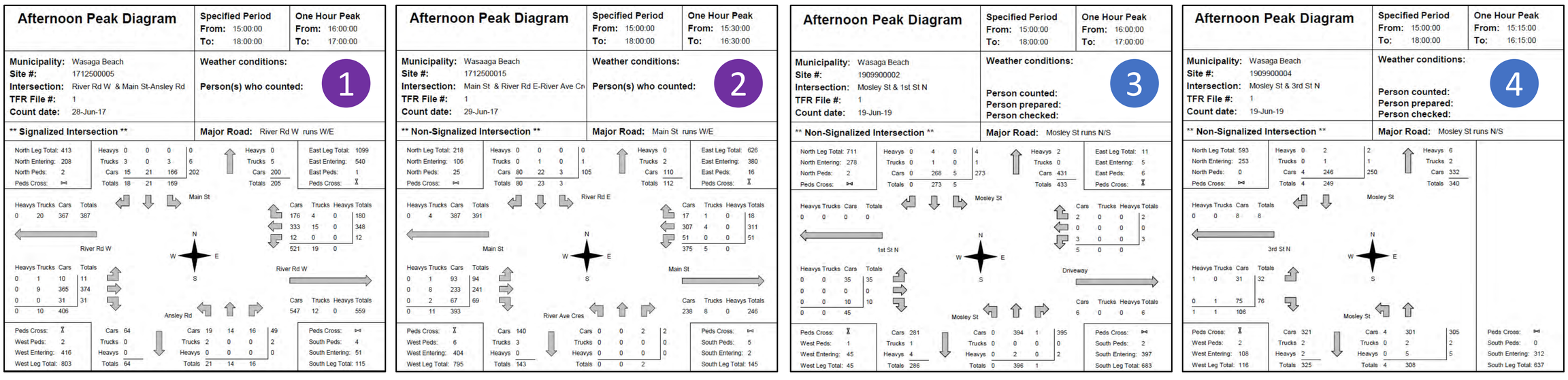
AVERAGE VS SUMMER PEAK HOUR

- The summer weekend peak hour volumes are 10 to 60% greater than the average peak hour volumes.



- As per the *Town of Wasaga Beach 2017 Transportation Study Update,* **summer weekend conditions are not considered an appropriate design parameter**. Designs based on summer weekend conditions will be "over designed" for the non-summer weekend periods.
- Rather, **average conditions should be used**.
- As per the traffic counts, the volumes during the PM peak hour are greater than the AM peak hour on the average day.
- The basis for transportation review is therefore **AVERAGE DAY PM PEAK HOUR.**

AVERAGE DAY PM PEAK HOUR VOLUMES AT KEY INTERSECTIONS



Main Street and Beach Areas 1 & 2 Improvements

EXISTING TRAFFIC VOLUMES

TRAFFIC CAPACITY

The capacity of a road can vary by road section, as dictated by such things as:

- lane width
- lateral clearance
- commercial vehicles
- road alignment and geometry
- travel speed
- number of lanes
- drivers and vehicular characteristics
- presence of intersections
- presence of driveways
- presence of parking
- presence of pedestrians
- presence of cyclists

For this transportation assessment, the assumed road capacities range from 400 to 900 vehicles per hour per lane (vphpl).

Main Street
800 to 900 vphpl

Mosley Street
600 to 700 vphpl

Beach Drive
400 to 500 vphpl

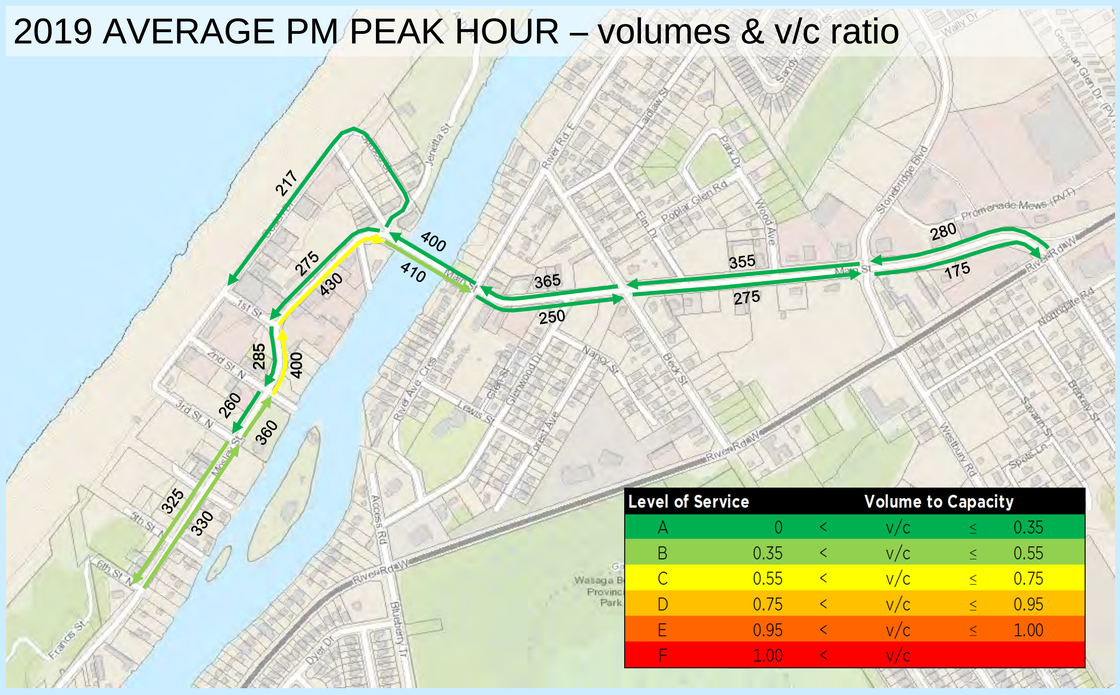
TRAFFIC OPERATIONS – ROAD SECTIONS

Existing traffic operations have been reviewed in context of the existing traffic volumes and the noted road capacities.

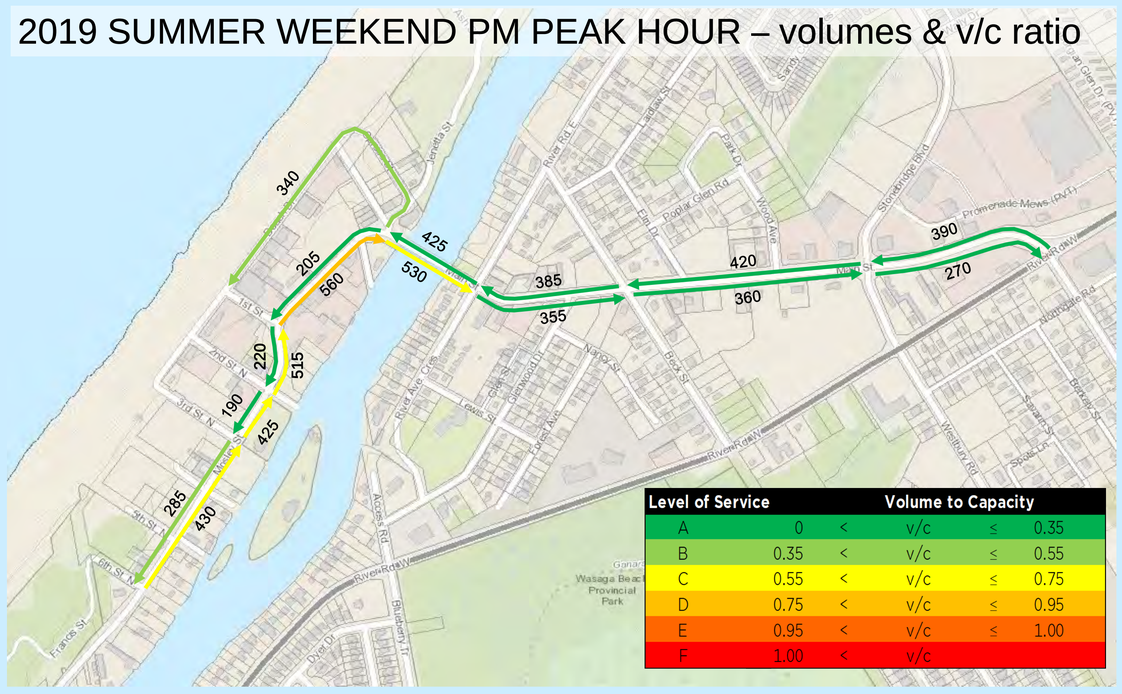
- For each section, a volume to capacity ratio (v/c) ratio has been determined, which is a measure of how much road capacity is being consumed (ie. a v/c ratio of 0.85 indicates that 85% of the available capacity is used).
- The lower the volume to capacity, the better the level of service that the road provides (LOS A is best, LOS F is worst).

- Based on the 2019 traffic volumes, all roads provide acceptable operations under Average PM Peak Hour conditions (LOS C or better). For comparative purposes, the Summer Weekend PM Peak Hour conditions have also been provided.
- In all cases, the existing road system is adequate - no road widenings are required to provide additional lane capacity.

2019 AVERAGE PM PEAK HOUR – volumes & v/c ratio



2019 SUMMER WEEKEND PM PEAK HOUR – volumes & v/c ratio



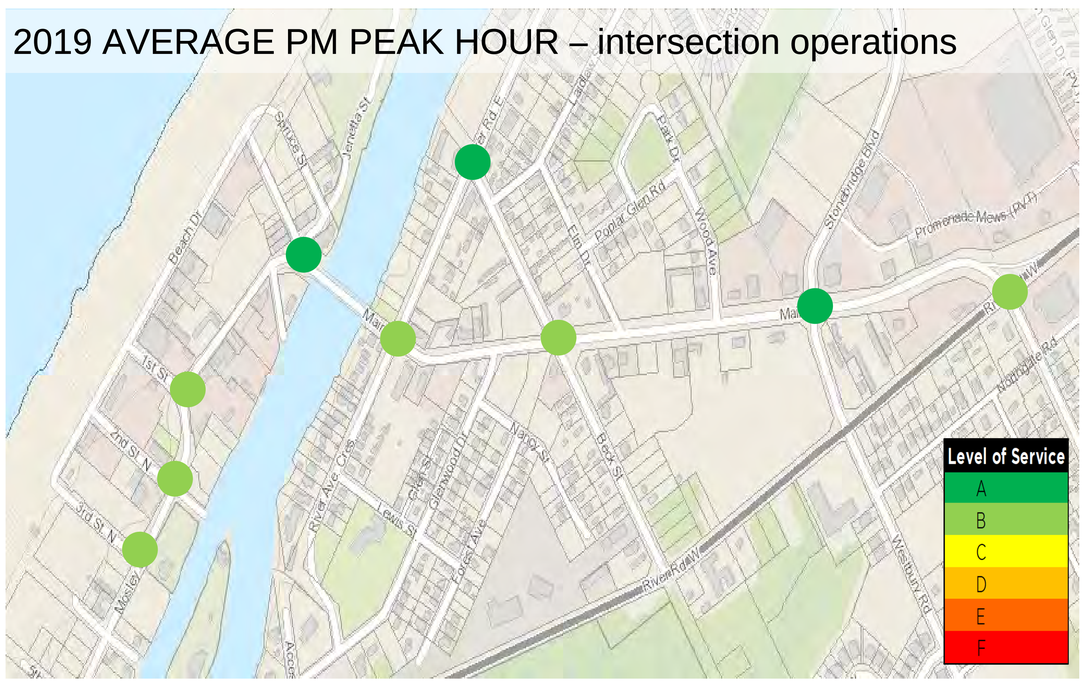
TRAFFIC OPERATIONS – INTERSECTIONS

Existing traffic operations have also been considered in context of intersection operations.

- Intersection capacity is based on the same criteria as noted above, in addition to the volumes of the individual movements (ie. left turn, through or right turn).

- Under 2019 Average PM Peak Hour conditions, all intersections provide acceptable operations (Level of Service B or better).
- No intersection improvements are therefore necessary.

2019 AVERAGE PM PEAK HOUR – intersection operations



Main Street and Beach Areas 1 & 2 Improvements

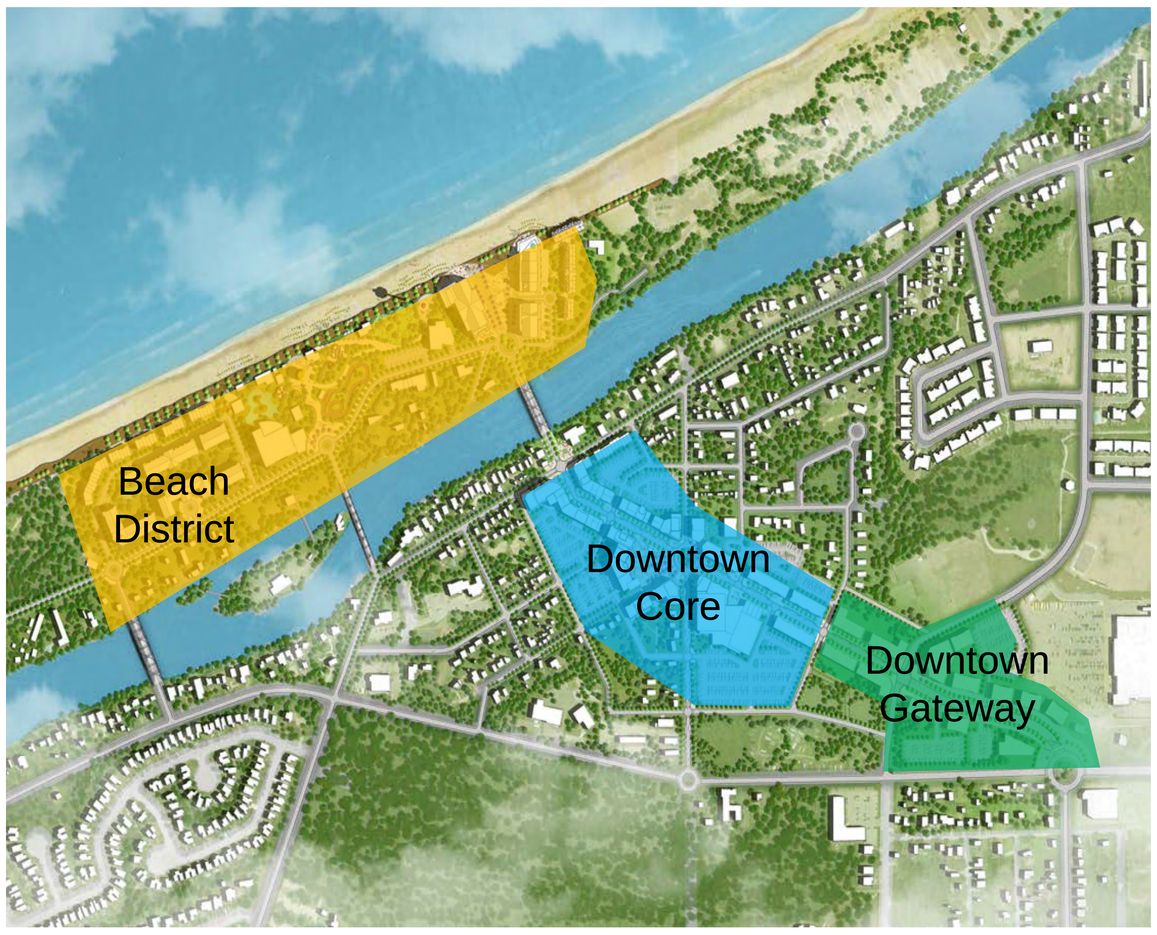
EXISTING TRAFFIC OPERATIONS

FUTURE DEVELOPMENT

To establish future traffic volumes, consideration has been given to the development program provided in the DDMP, with additional input from Town planning staff with respect to residential density.

The following development assumptions have been considered:

BEACH DISTRICT	DOWNTOWN CORE	DOWNTOWN GATEWAY
1000 medium density residential units	**700** medium density residential units	**270** medium density residential units
13,275m² commercial gross floor area	**14,000m²** commercial gross floor area	**5,100m²** commercial gross floor area



DEVELOPMENT PHASING

25% by 2026

50% by 2031

100% by 2041

DEVELOPMENT TRAFFIC

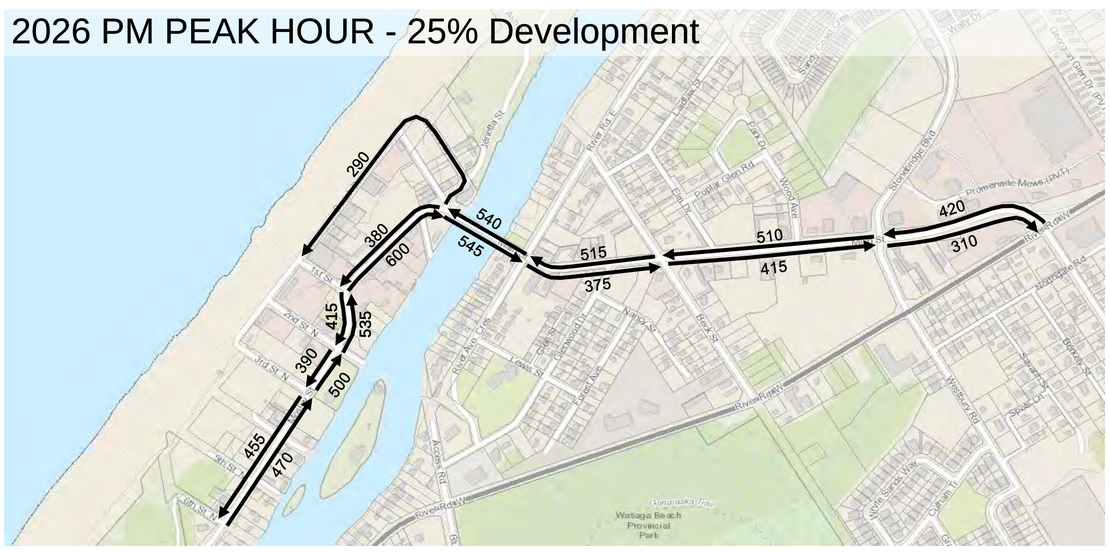
Trip estimates for the future development were established using industry standard trip generation data (*ITE Trip Generation Manual, 10th Edition*) and assigned to the study area road network

FUTURE TRAFFIC PROJECTIONS

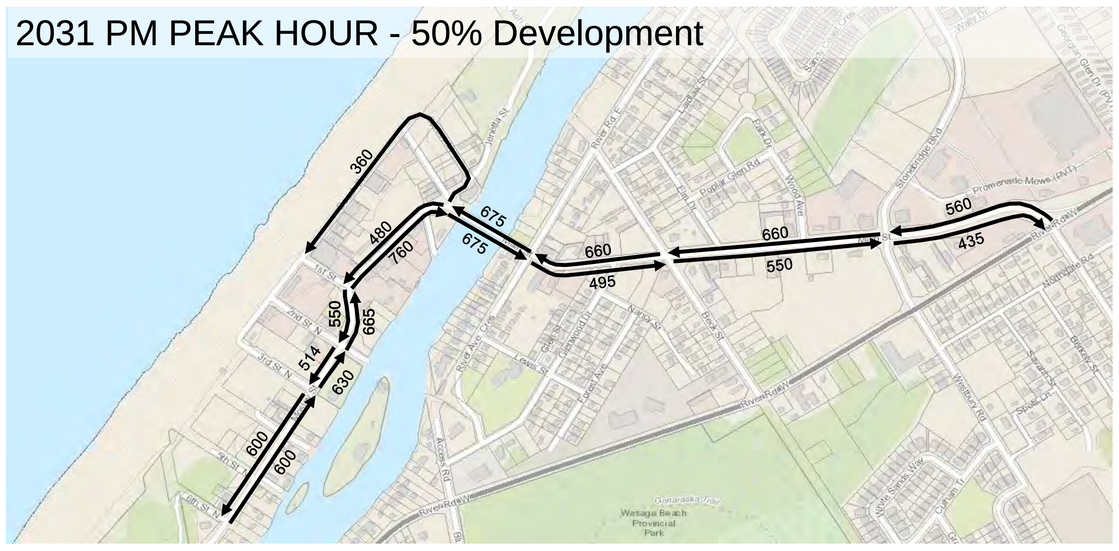
Future traffic projections have been prepared for the Average Day PM Peak Hour for 2026, 2031 and 2041 based on:

2019 AVERAGE PM PEAK HOUR + **GENERAL GROWTH IN THE AREA** + **DEVELOPMENT SPECIFIC GROWTH**

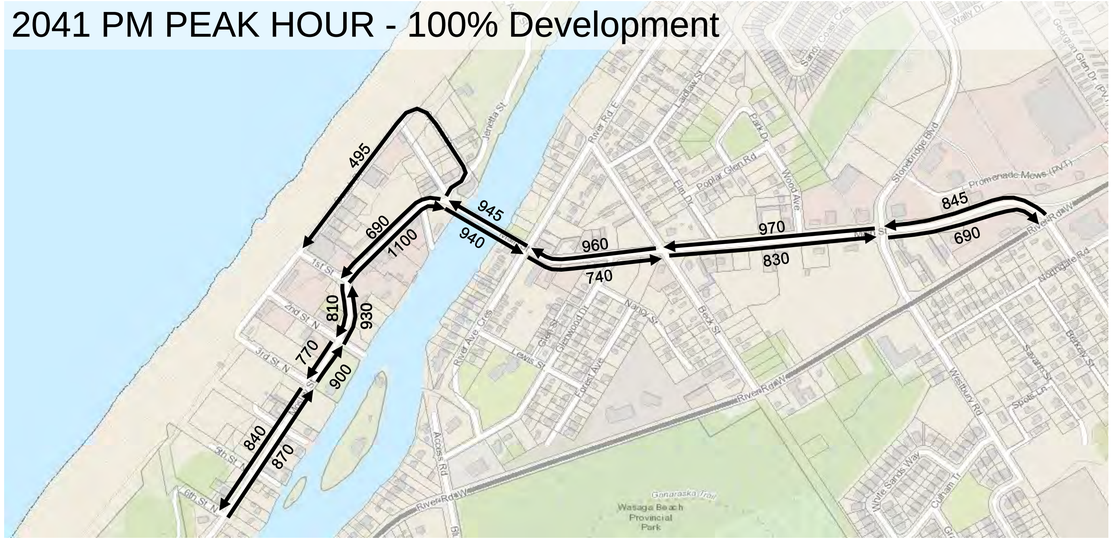
2026 PM PEAK HOUR - 25% Development



2031 PM PEAK HOUR - 50% Development



2041 PM PEAK HOUR - 100% Development



FUTURE LANE REQUIREMENTS

2026 & 2031 Horizon Years

- Based on the projected volumes and assumed lane capacities for each road, a single lane per direction will provide sufficient capacity through the 2031 horizon.

2041 Horizon Year

- The 2041 traffic projections suggest additional capacity may be required to accommodate the noted volumes.

DOWNTOWN VISION

The Town of Wasaga Beach has identified the beachfront and surrounding area, consisting of the Main Street, Mosley Street and Beach Drive corridors, as an integral component of the Town's vision to develop a livable, accessible and sustainable all-season town-centre for the entire community, including existing and future residents and visitors.

In consideration of the existing road and infrastructure conditions, and in context of the requirements to support the Town's vision for a Downtown as identified in the *Downtown Development Master Plan* with respect to traffic volumes (vehicular, cycling and pedestrian) and municipal services, a Problem/Opportunity Statement has been defined.

PROBLEM / OPPORTUNITY STATEMENT

That existing traffic and infrastructure needs and deficiencies along the subject lengths of Main Street (from River Road West to Mosley Street), Mosley Street (from Main Street to 6th Street) and Beach Drive be addressed in an environmentally sound manner, in consideration of future traffic needs, current Town standards, active transportation opportunities and municipal infrastructure requirements, with the objective of facilitating future growth while providing safe and efficient travel for all road users."

PROCESS TO ADDRESS THE PROBLEM / OPPORTUNITY STATEMENT

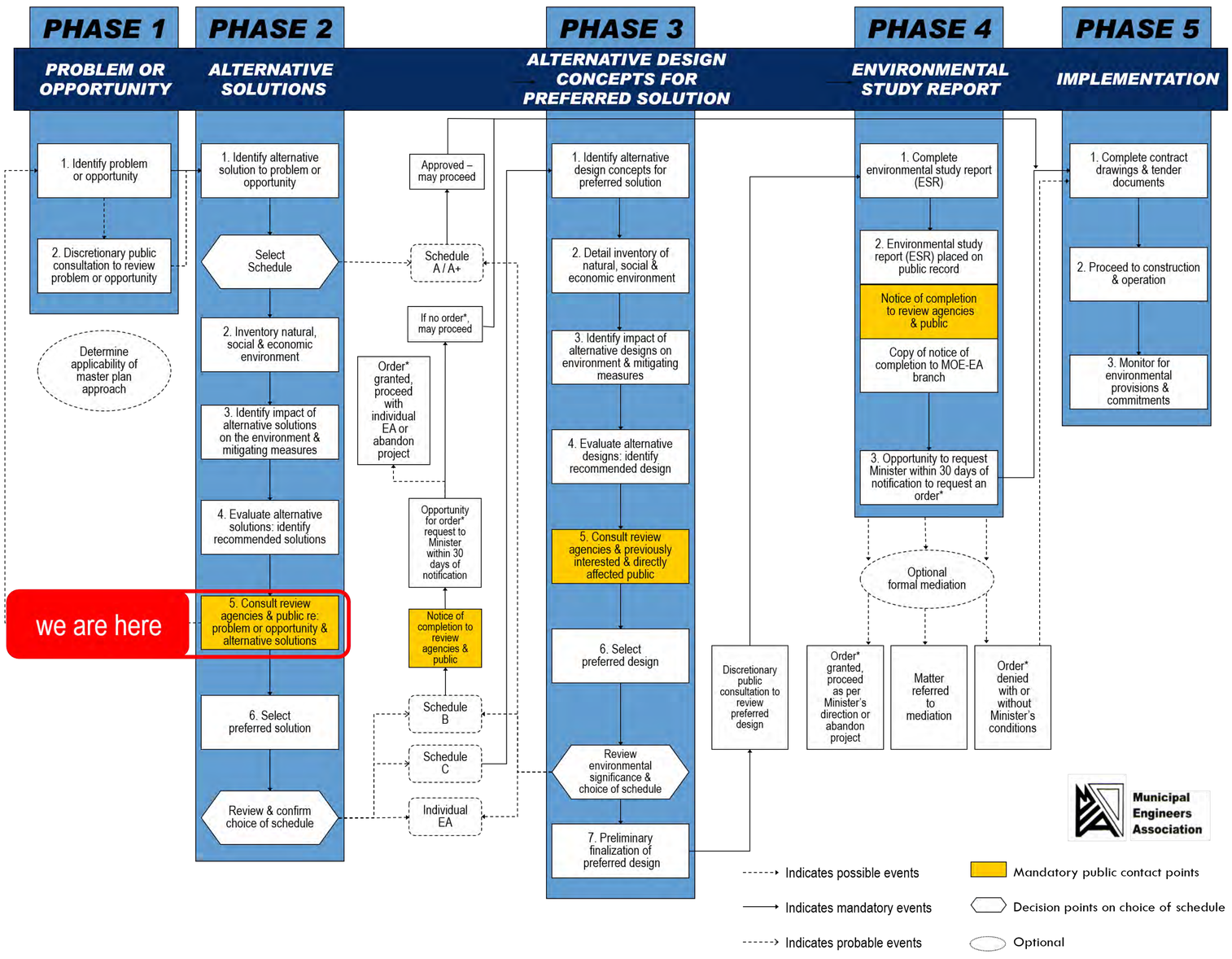
To address the problem/opportunity statement and explore opportunities for improvements to Main St and Beach Areas 1 & 2, a Class Environmental Assessment will be undertaken.

The Class EA schedule is based on the type of project, potential impacts and construction value.

The project will be undertaken as a Schedule C Class EA, with the completion of Phases 1 to 5 (see aside).

Opportunities for public review & input include:

- response to notices (Notice of Commencement, Notice of PICs x2 and Notice of Completion)
- public information centres (PICs x2)
- 30-day review of final report

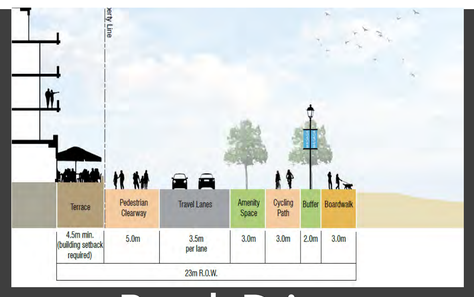


Main Street and Beach Areas 1 & 2 Improvements

PROBLEM IDENTIFICATION

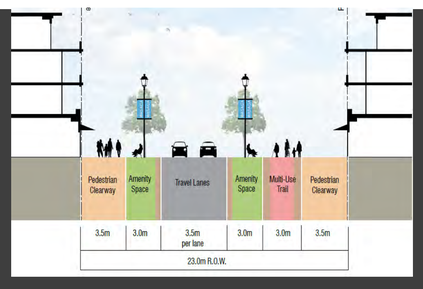
RIGHT-OF-WAY

What is the available road right-of-way within which the improvements must be assembled?



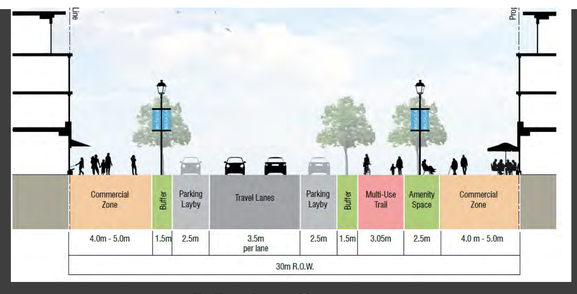
Beach Drive

- 20 to 26m existing ROW
- 23m proposed as per UDG



Mosley Street

- 13 to 20m existing ROW
- 23m proposed as per UDG

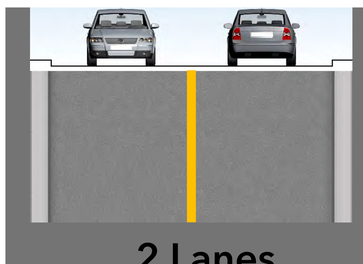


Main Street

- 20 to 30m existing ROW
- 30m proposed as per UDG

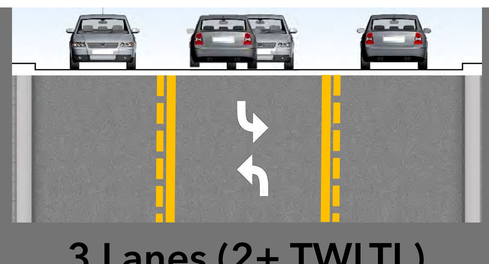
VEHICLES

What is the most appropriate manner to address more vehicle travel demands?



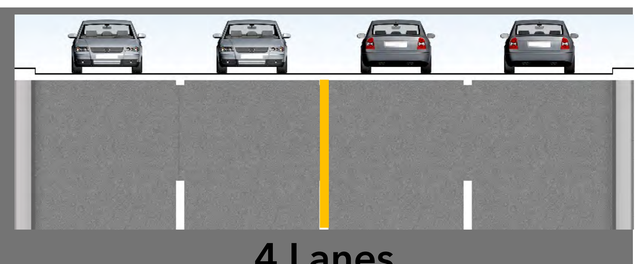
2 Lanes

- 3.25 to 3.5m widths
- lowest capacity
- least footprint



3 Lanes (2+ TWLTL)

- 3.25 to 3.5m thru widths
- 3.5 to 5.0m centre turn lane
- centre lane aids with left turns and increases capacity



4 Lanes

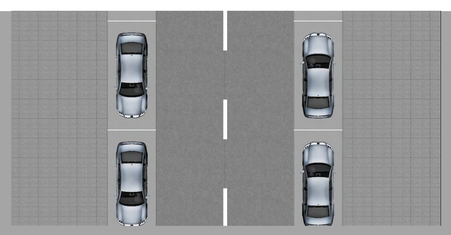
- 3.25 to 3.5m thru widths
- maximum capacity through provision of additional lanes
- maximum footprint

PARKING

What is the most appropriate manner to accommodate demands for parking?

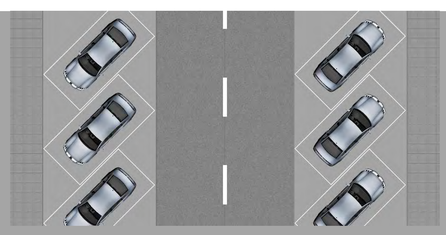
No Parking

- must provide parking elsewhere
- impacts to commercial / retail operations



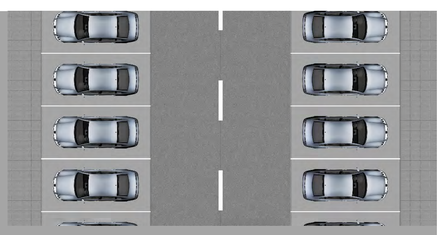
Parallel Parking

- 2.2 to 2.5m width
- least footprint
- common arrangement
- ease of egress



45° Angle Parking

- 5.8m width
- greater footprint
- reverse movement can be difficult



90 ° Angle Parking

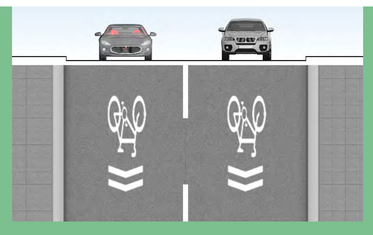
- 6.0m width
- greatest footprint
- maximizes parking count
- difficult reverse

BICYCLES

What is the most appropriate manner to address bicycle travel demands?

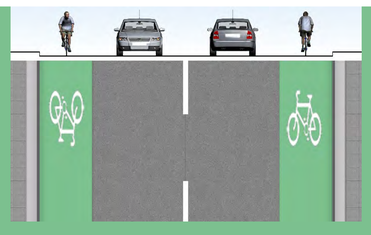
No Bicycles

- no specific bicycle facilities provided
- cyclists to travel on lanes or sidewalk



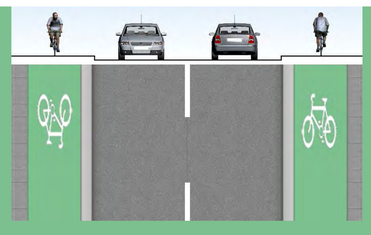
Shared Lanes

- 4.0 to 4.50m lanes
- no designated area specific to cyclists



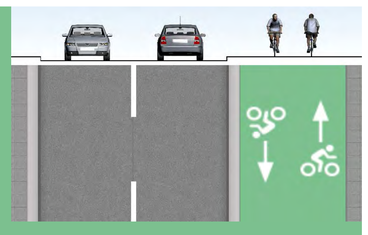
Bike Lanes

- 1.5 to 2.0m
- 0.5 to 1.0m buffer if adjacent to parking



Cycle Tracks

- 1.5 to 2.0m
- 1.0m buffer if adjacent to parking

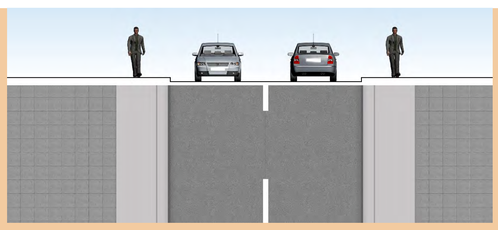


Cycle Tracks

- 2.0 to 4.0m
- 1.0m buffer if adjacent to parking

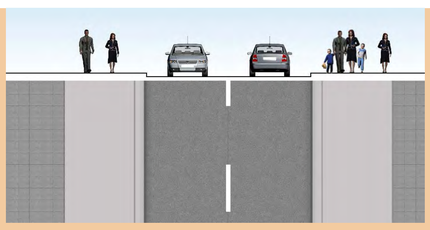
PEDESTRIANS

What is the most appropriate manner to address pedestrian travel demands?



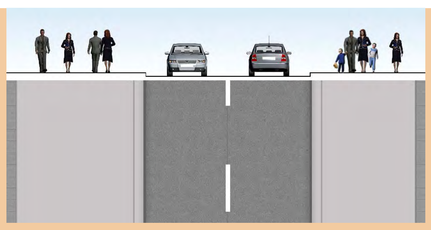
Standard Sidewalks

- 1.5 to 2.0m sidewalks
- minimum configuration



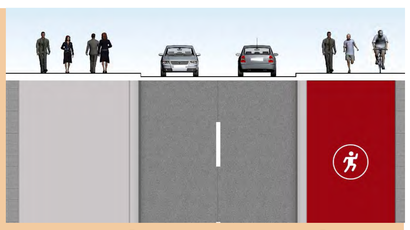
Wide Sidewalks

- 3.0m sidewalks
- better accommodation of increased volumes and types of users



Wider Sidewalks

- 4.0 to 5.0m sidewalks
- best accommodation of increased volumes and types of users



Multi-Use Trails

- 3.0 to 4.0m trails
- for cyclists and peds
- increased potential for conflict

RETAIL / COMMERCIAL

What opportunities can be provided to support retail / commercial development?

Commercial Zones

- 3.0 to 5.0m desired to allow for commercial activities
- can include sandwich boards, outdoor sales, etc.

CLASS EA PHASE 2 - Alternative Solutions

Under the Class EA process (see previous slide), the first step in establishing the ultimate road improvements is to determine the most appropriate solution to the problem.

The focus is therefore on what elements need to be included in the ultimate road cross-section (ie. how many lanes, type of parking, type of bike facility, etc.), with the understanding that the design details will be addressed in the next phase.

ALTERNATIVE SOLUTIONS - MAIN STREET

RIGHT-OF-WAY

- 30m as proposed in the UDM
- 20 to 30m existing (additional ROW will be required)

VEHICLES

- consider 2 lanes
- consider centre turn lane to accommodate left turns and increase capacity

PARKING

- on-street parallel parking given need to service abutting retail/commercial

BICYCLES

- desire to provide dedicated bike facilities
- separate from vehicles & pedestrians

PEDESTRIANS COMMERCIAL

- combine pedestrian & commercial zone
- maximize available space

Main Street - Alternative Solutions

These solutions are intended to illustrate the desired elements within the ultimate Main Street cross-section and the overall relationship of each.

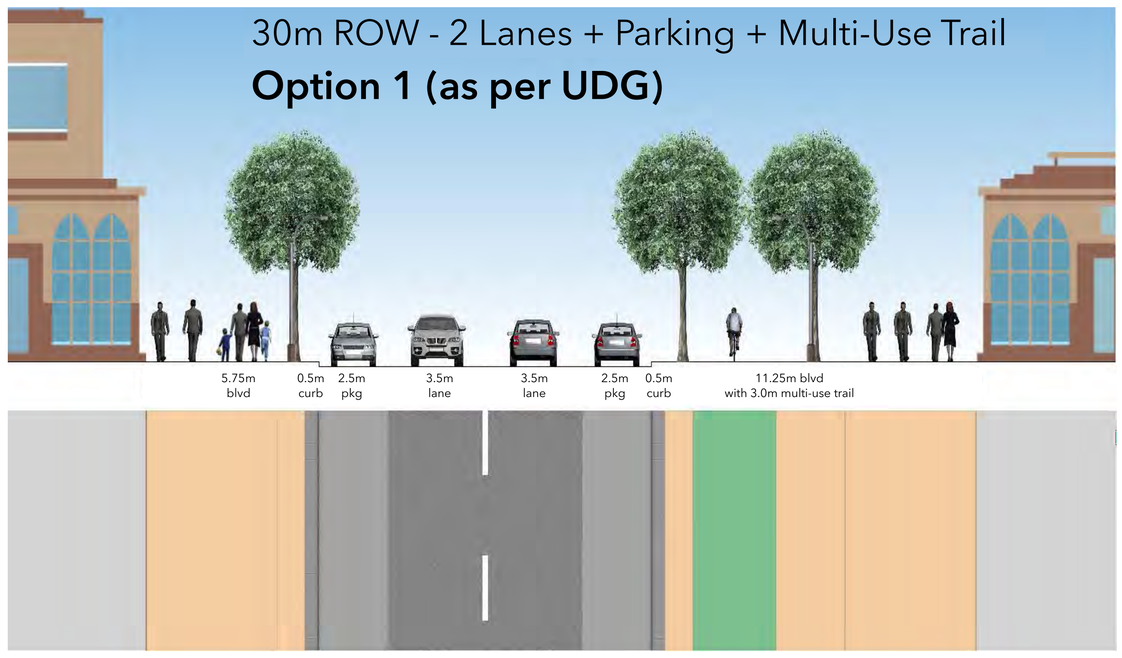
The configuration and composition of the boulevards (which are to include buffer space, amenity zones, pedestrian through zones and retail/commercial zones) are for illustration purposes only.

The next phase of the study will advance the Preferred Solution for Main Street and develop Alternative Design Concepts for it, with greater details as to dimensions, arrangements, landscape and streetscape, materials, etc.

What is presented here are only preliminary representations.

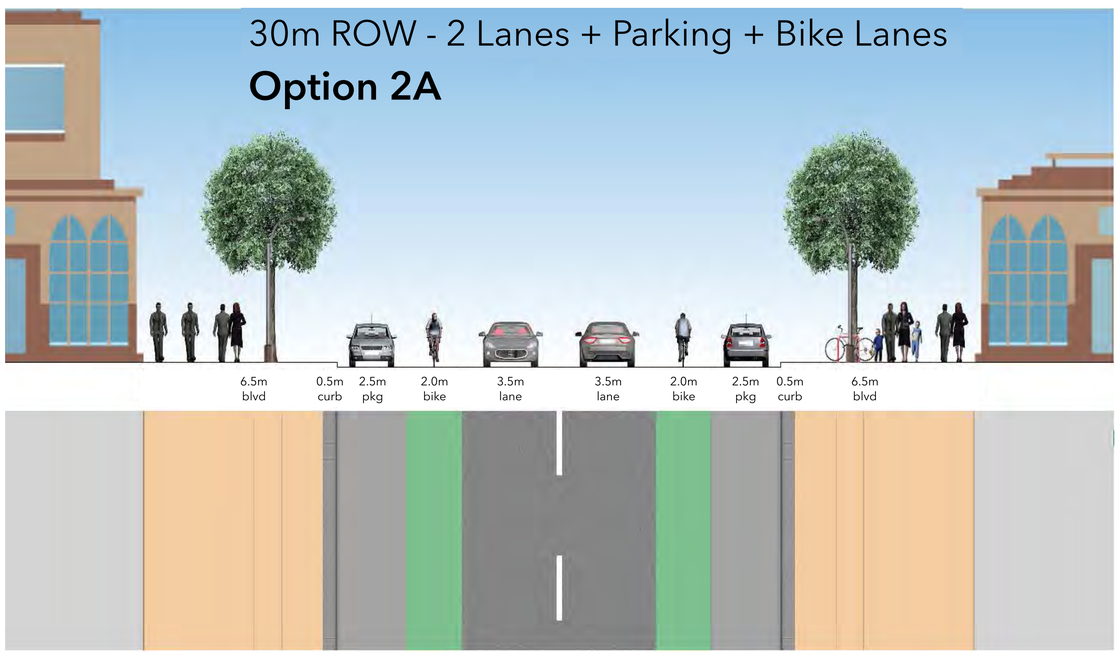
30m ROW - 2 Lanes + Parking + Multi-Use Trail

Option 1 (as per UDG)



30m ROW - 2 Lanes + Parking + Bike Lanes

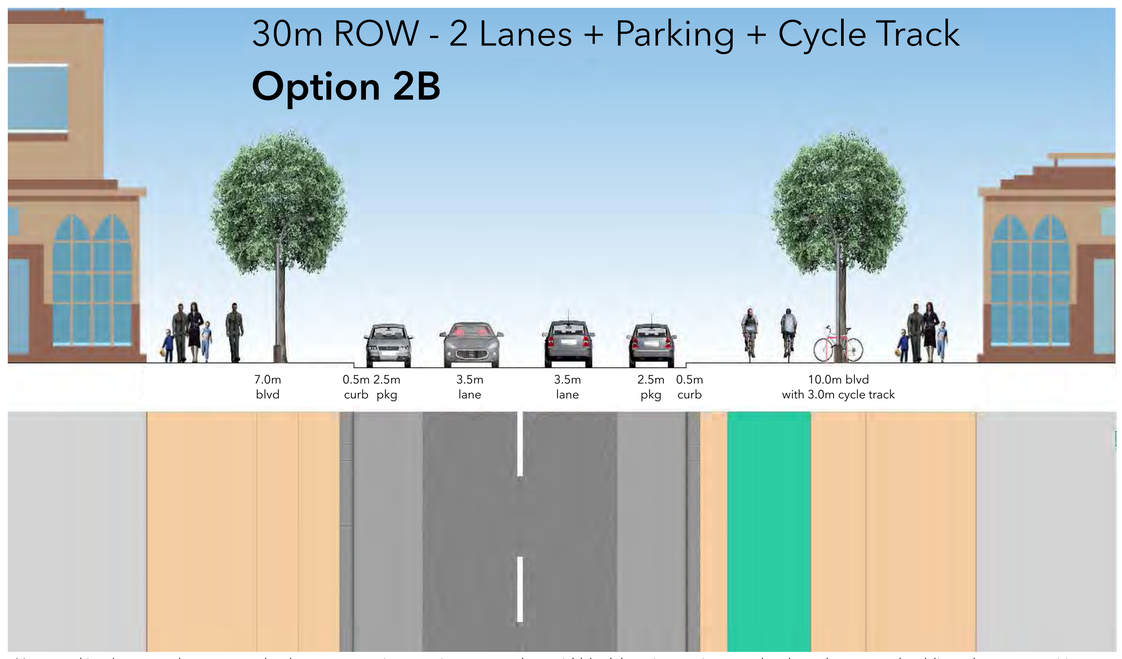
Option 2A



Note: parking lanes can be converted to bump-outs at intersections or at select mid-block locations to increase boulevard space and public realm opportunities

30m ROW - 2 Lanes + Parking + Cycle Track

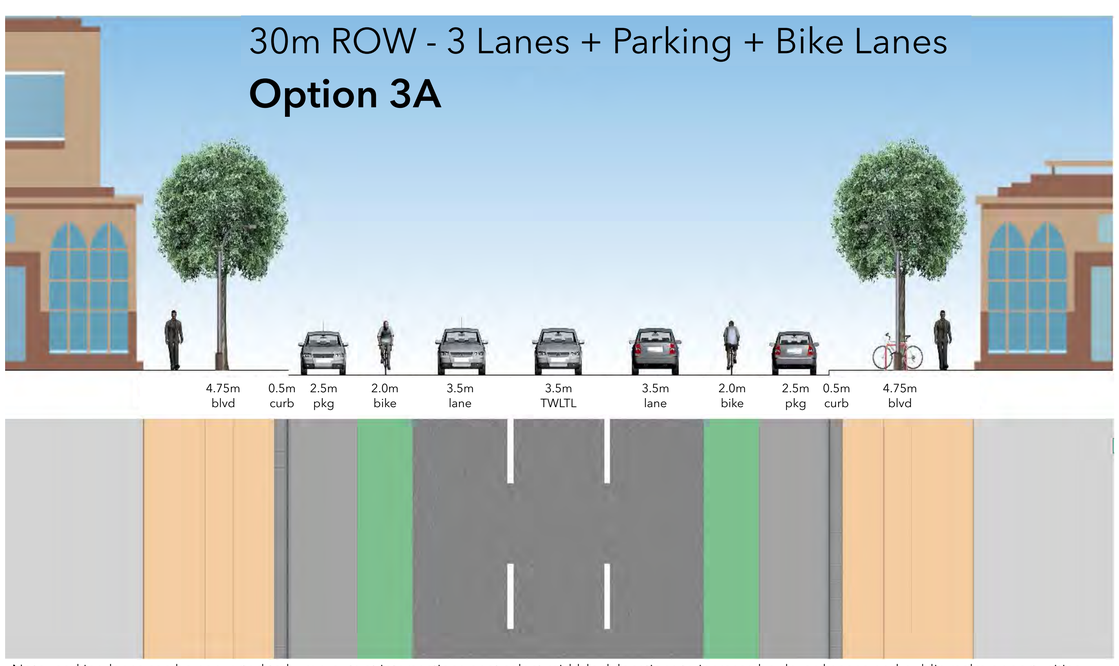
Option 2B



Note: parking lanes can be converted to bump-outs at intersections or at select mid-block locations to increase boulevard space and public realm opportunities

30m ROW - 3 Lanes + Parking + Bike Lanes

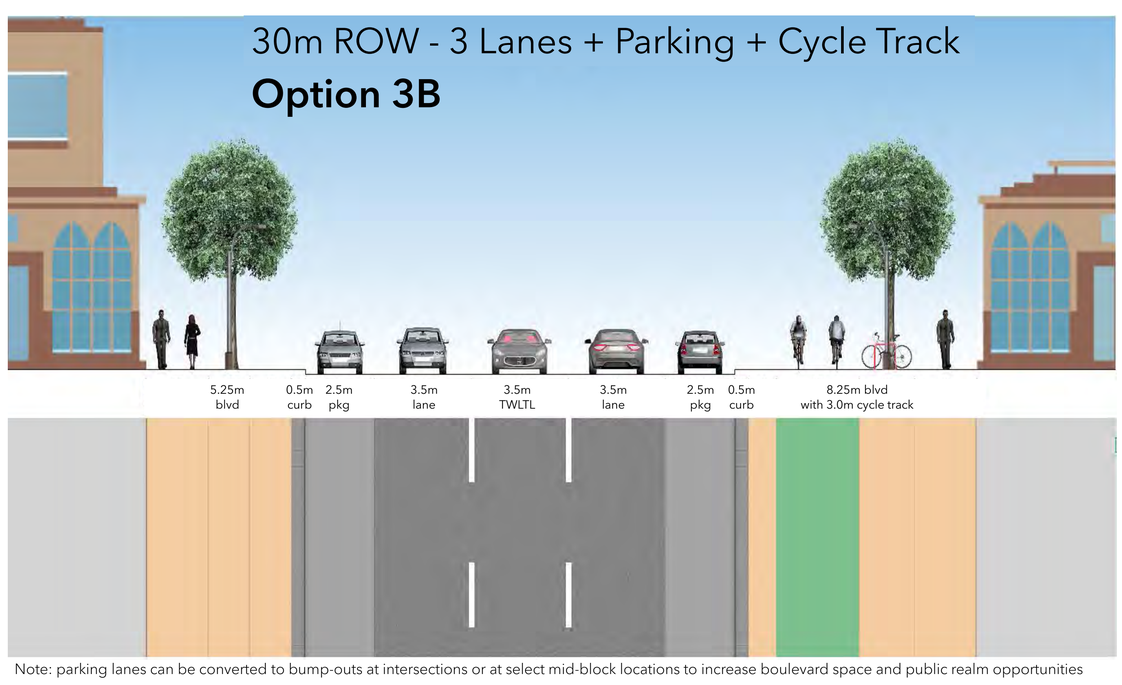
Option 3A



Note: parking lanes can be converted to bump-outs at intersections or at select mid-block locations to increase boulevard space and public realm opportunities

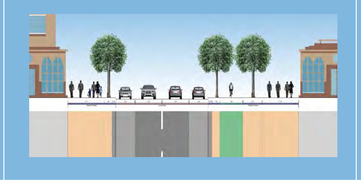
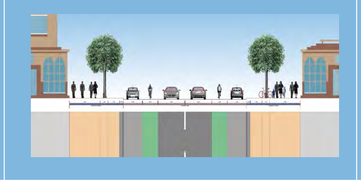
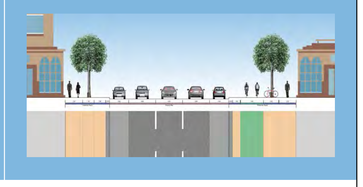
30m ROW - 3 Lanes + Parking + Cycle Track

Option 3B



Note: parking lanes can be converted to bump-outs at intersections or at select mid-block locations to increase boulevard space and public realm opportunities

ASSESSMENT OF ALTERNATIVE SOLUTIONS - MAIN STREET

Evaluation Criteria		How Criteria is Being Assessed	Option 1 	Option 2A 	Option 2B 	Option 3A 	Option 3B 
Transportation	Vehicles	Ability to accommodate future traffic volumes	▪ Lower capacity as compared to 3-lane options	× Lowest capacity due to 2-lane profile & on-road bike lanes	▪ Lower options capacity as compared to 3-lane	▪ Greater capacity as compared to 2-lane options	✓ Greatest capacity due to 3-lane profile & separated cycle track
	Parking	Ability to service abutting retail/ commercial	✓ On-street parallel parking provided	✓ On-street parallel parking provided	✓ On-street parallel parking provided	✓ On-street parallel parking provided	✓ On-street parallel parking provided
	Cyclists	Cycling operation and safety	▪ Better operations/ safety as compared to on-street bike lanes ▪ Potential conflict with other users (i.e. pedestrians) on multi-use trail	▪ Good operations/safety as compared to no facilities	✓ Best operations/safety given separated and dedicated cycle track	▪ Good operations/safety as compared to no facilities	✓ Best operations/safety given separated and dedicated cycle track
	Pedestrians	Pedestrian operation and safety along study corridor	✓ Wider sidewalks provide best accommodation for increased pedestrian volumes ▪ Increased potential for conflict with cyclists on multi-use trail	✓ Wider sidewalks provide best accommodation for increased pedestrian volumes	✓ Wider sidewalks provide best accommodation for increased pedestrian volumes	✓ Wider sidewalks provide best accommodation for increased pedestrian volumes	✓ Wider sidewalks provide best accommodation for increased pedestrian volumes
	Promote AT	Likelihood to promote and foster Active Transportation use	▪ Better potential to promote Active Transportation	▪ Good potential to promote Active Transportation	✓ Best potential to promote Active Transportation	▪ Good potential to promote Active Transportation	✓ Best potential to promote Active Transportation
Natural Environment	Fisheries / Aquatic Impacts	Impact to fish habitat and other aquatic features	▪ Impacts to natural environment to be similar for all alternatives				
	Wildlife / Terrestrial Impacts	Impact to wildlife species	▪ Impacts to natural environment to be similar for all alternatives				
	Vegetation Impacts	Impact to vegetation communities on adjacent properties	▪ Impacts to natural environment to be similar for all alternatives				
Social Environment	Property Impacts	Impacts to property based on widening of road platform and/or ROW	▪ No impact to adjacent properties ▪ 30m ROW consistent for all options				
	Construction Impacts	Future impacts to adjacent properties	▪ Impacts similar across all options ▪ Minor, short-term, impacts during construction				
Cultural Heritage	Archaeological & Heritage Impacts	Impacts to cultural and heritage features	▪ Impacts similar across all options ▪ No anticipated archaeological or cultural/heritage impacts as the work will be largely within the existing right-of-way or abutting lands which have likely been previously disturbed				
Economic Environment	Construction Costs	Costs to construct individual options	▪ Greater cost to construct as compared to other 2-lane options	✓ Lowest cost to construct	✓ Lowest cost to construct	× Greatest cost to construct	× Greatest cost to construct
	Maintenance Costs	Future maintenance requirements	▪ Lower cost to maintain	▪ Low cost to maintain	✓ Lowest cost to maintain	× Greatest cost to maintain	▪ Greater cost to maintain
	Land Acquisition Costs	Total land acquisition costs	▪ Land acquisition costs similar for all options (30m ROW)				
	Economic Opportunities	Retail & Commercial Enhancements	✓ Greatest opportunity for commercial engagement with public due to wider boulevards (comparable to Option 2B)	▪ Good opportunity for commercial engagement with public due to wide boulevards	✓ Greatest opportunity for commercial engagement with public due to wider boulevards (comparable to Option 1)	× Least opportunity for commercial engagement with public due	▪ Good opportunity for commercial engagement with public due to wider boulevards

ALTERNATIVE SOLUTIONS - MOSLEY STREET

RIGHT-OF-WAY	VEHICLES	PARKING	BICYCLES	PEDESTRIANS COMMERCIAL
▪ 23m as proposed in the UDM ▪ 13 to 20m existing (additional ROW will be required)	▪ consider 2 lanes ▪ consider centre turn lane to accommodate left turns and increase capacity	▪ consider on-street parallel parking ▪ municipal off-street parking is expected ▪ recognize limited right-of-way	▪ consider bicycle facilities ▪ recognize limited right-of-way ▪ use Shore Lane Trail system & Beach Drive also	▪ combine pedestrian & commercial zone ▪ maximize available space

Mosley Street - Alternative Solutions

These solutions are intended to illustrate the desired elements within the ultimate Mosley Street cross-section and the overall relationship of each.

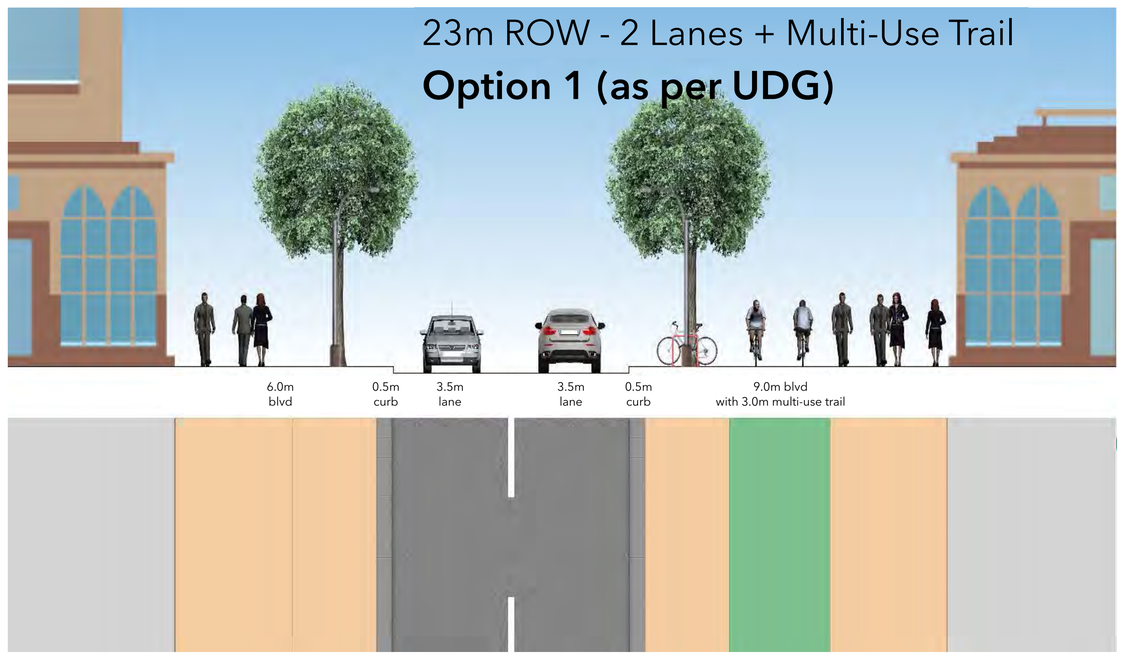
The configuration and composition of the boulevards (which are to include buffer space, amenity zones, pedestrian through zones and retail/commercial zones) are for illustration purposes only.

The next phase of the study will advance the Preferred Solution for Mosley Street and develop Alternative Design Concepts for it, with greater details as to dimensions, arrangements, landscape and streetscape, materials, etc.

What is presented here are only preliminary representations.

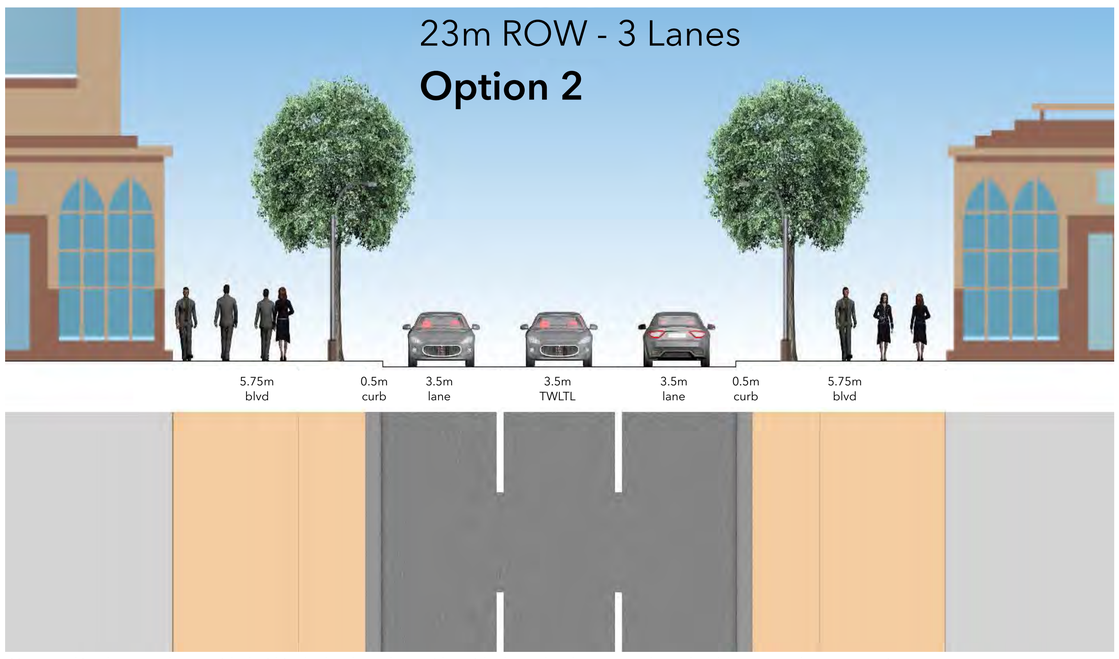
23m ROW - 2 Lanes + Multi-Use Trail

Option 1 (as per UDG)



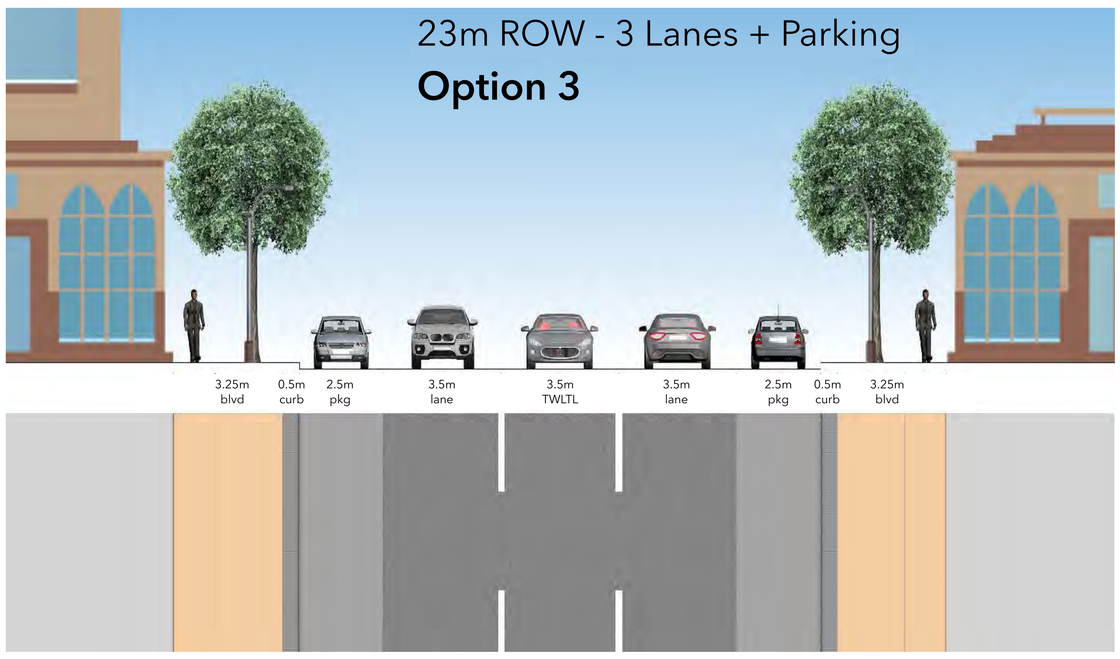
23m ROW - 3 Lanes

Option 2



23m ROW - 3 Lanes + Parking

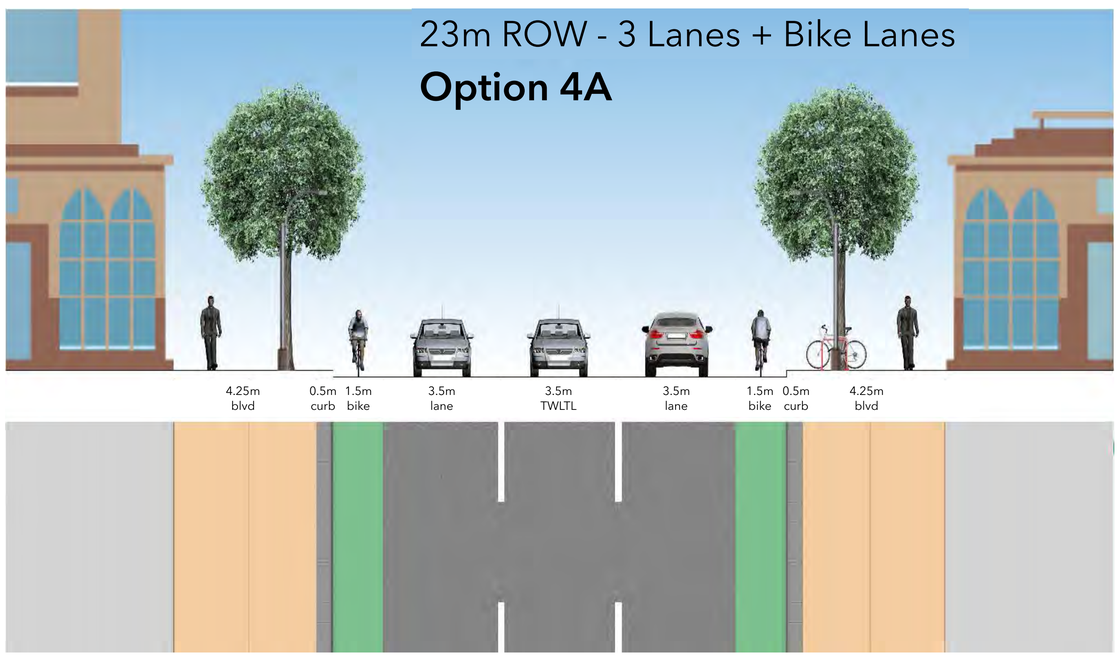
Option 3



Note: parking bays can be provided within the boulevards on either side through select areas where development and space permit

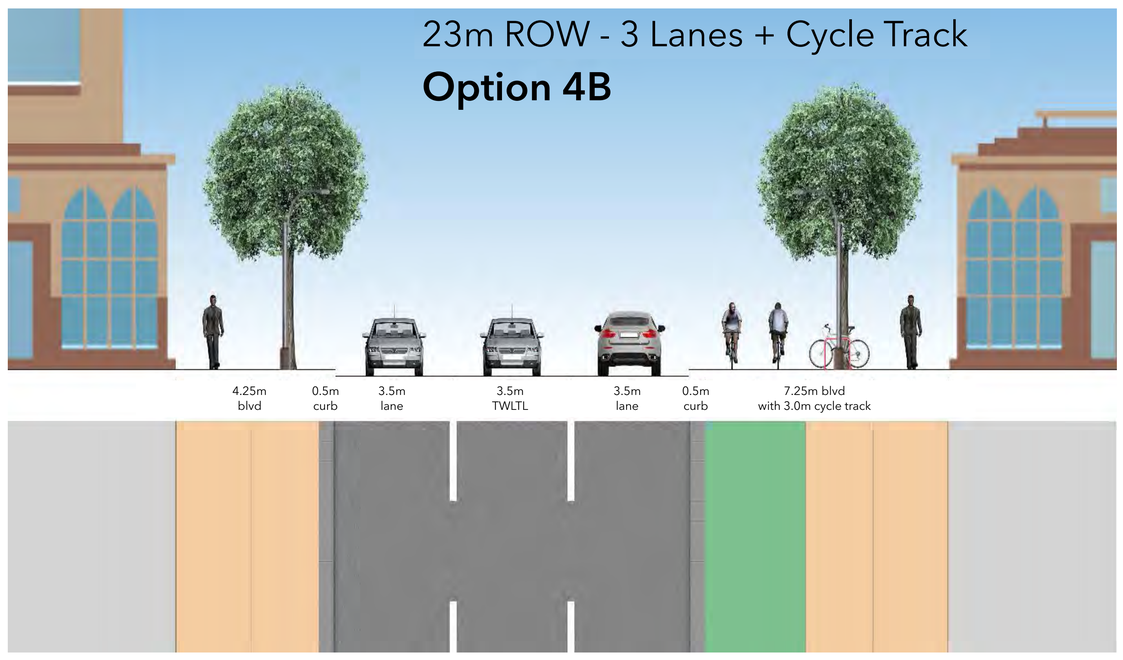
23m ROW - 3 Lanes + Bike Lanes

Option 4A

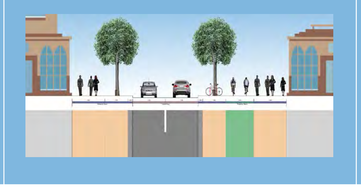
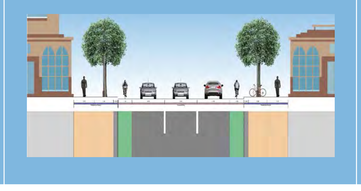
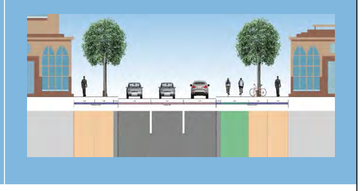


23m ROW - 3 Lanes + Cycle Track

Option 4B

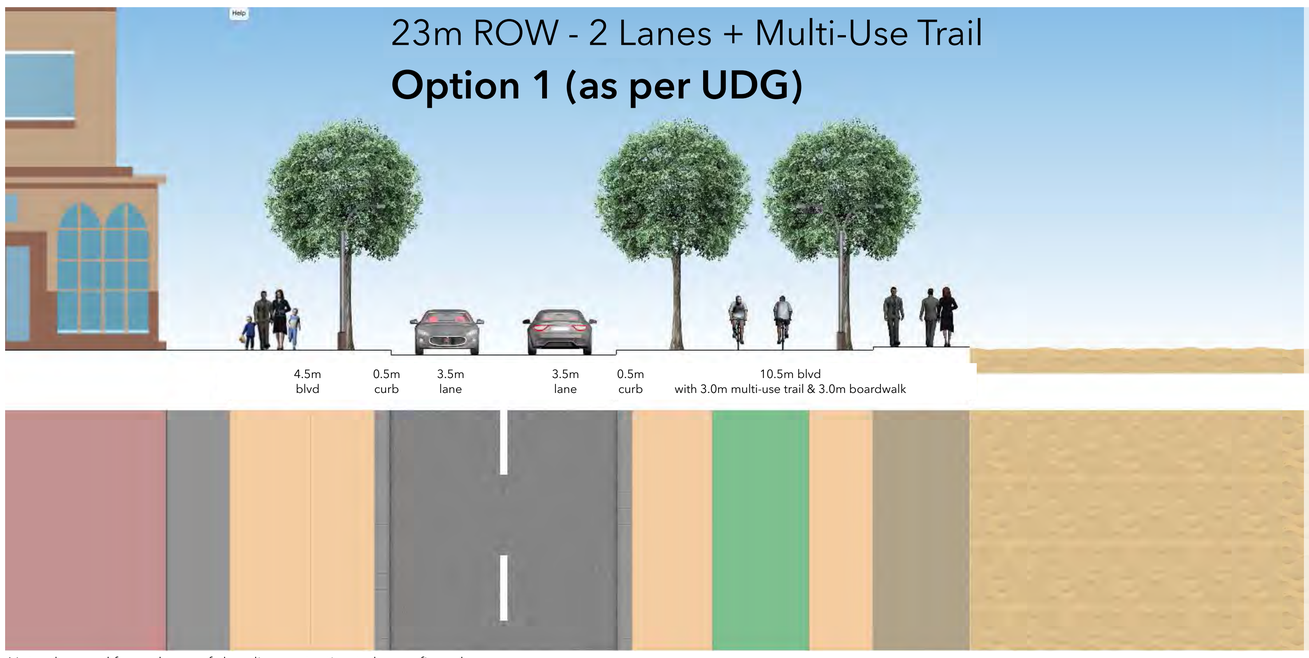


ASSESSMENT OF ALTERNATIVE SOLUTIONS - MOSLEY STREET

Evaluation Criteria		How Criteria is Being Assessed	Option 1 	Option 2 	Option 3 	Option 4A 	Option 4B 
Transportation	Vehicles	Ability to accommodate future traffic volumes	× Lowest capacity as compared to 3-lane options	✓ Greatest capacity given omission of on-street parking and bike lanes	▪ Lower options capacity as compared to 3-lane	▪ Greater capacity as compared to 2-lane options	✓ Greatest capacity given omission of on-street parking and separated cycle track
	Parking	Ability to service abutting retail/ commercial	× No on-street parallel parking provided	▪ Parking bays may be possible in select areas within the boulevard	✓ On-street parallel parking provided	× On-street parallel parking provided	× On-street parallel parking provided
	Cyclists	Cycling operation and safety	✓ Best operations/safety given separated and dedicated cycle track	▪ No provision for cyclists on Mosley St, rather they would be diverted to the Shore Lane Trail north of Mosley St through the beach area	▪ No provision for cyclists on Mosley St, rather they would be diverted to the Shore Lane Trail north of Mosley St through the beach area	▪ Good operations/safety as compared to no facilities	✓ Better operations/safety given separated and dedicated cycle track ▪ Narrow buffer reduces safety
	Pedestrians	Pedestrian operation and safety along study corridor	▪ Wide sidewalks provide good accommodation for increased pedestrian volumes	✓ Wider sidewalks provide best accommodation for increased pedestrian volumes	× Narrow sidewalks limit accommodation for increased pedestrian volumes	▪ Wide sidewalks provide good accommodation for increased pedestrian volumes	▪ Wide sidewalks provide good accommodation for increased pedestrian volumes
	Promote AT	Likelihood to promote and foster Active Transportation use	✓ Best potential to promote Active Transportation	▪ Average potential to promote Active Transportation	× Least potential to promote Active Transportation	▪ Good potential to promote Active Transportation	▪ Good potential to promote Active Transportation
Natural Environment	Fisheries / Aquatic Impacts	Impact to fish habitat and other aquatic features	▪ Impacts to natural environment to be similar for all alternatives				
	Wildlife / Terrestrial Impacts	Impact to wildlife species	▪ Impacts to natural environment to be similar for all alternatives				
	Vegetation Impacts	Impact to vegetation communities on adjacent properties	▪ Impacts to natural environment to be similar for all alternatives				
Social Environment	Property Impacts	Impacts to property based on widening of road platform and/or ROW	▪ Impacts similar across all options ▪ 23m ROW consistent for all options				
	Construction Impacts	Future impacts to adjacent properties	▪ Impacts similar across all options ▪ Minor, short-term, impacts during construction				
Cultural Heritage	Archaeological & Heritage Impacts	Impacts to cultural and heritage features	▪ Impacts similar across all options ▪ Some potential impacts to adjacent built heritage, additional studies may be required to ensure appropriate mitigation				
Economic Environment	Construction Costs	Costs to construct individual options	▪ Lower cost to construct as compared to other 2-lane options	✓ Lowest cost to construct	✓ Low cost to construct	× Greatest cost to construct	× Greatest cost to construct
	Maintenance Costs	Future maintenance requirements	▪ Lower cost to maintain	✓ Lowest cost to maintain	✓ Low cost to maintain	× Greatest cost to maintain	× Greatest cost to maintain
	Land Acquisition Costs	Total land acquisition costs	▪ Land acquisition costs similar for all options (23m ROW)				
	Economic Opportunities	Retail & Commercial Enhancements	▪ Good opportunity for commercial engagement with public due to wide boulevards	✓ Greatest opportunity for commercial engagement with public due to wider boulevards	× Least opportunity for commercial engagement with public due to narrow boulevards	× Least opportunity for commercial engagement with public due to narrow boulevards	× Least opportunity for commercial engagement with public due to narrow boulevards

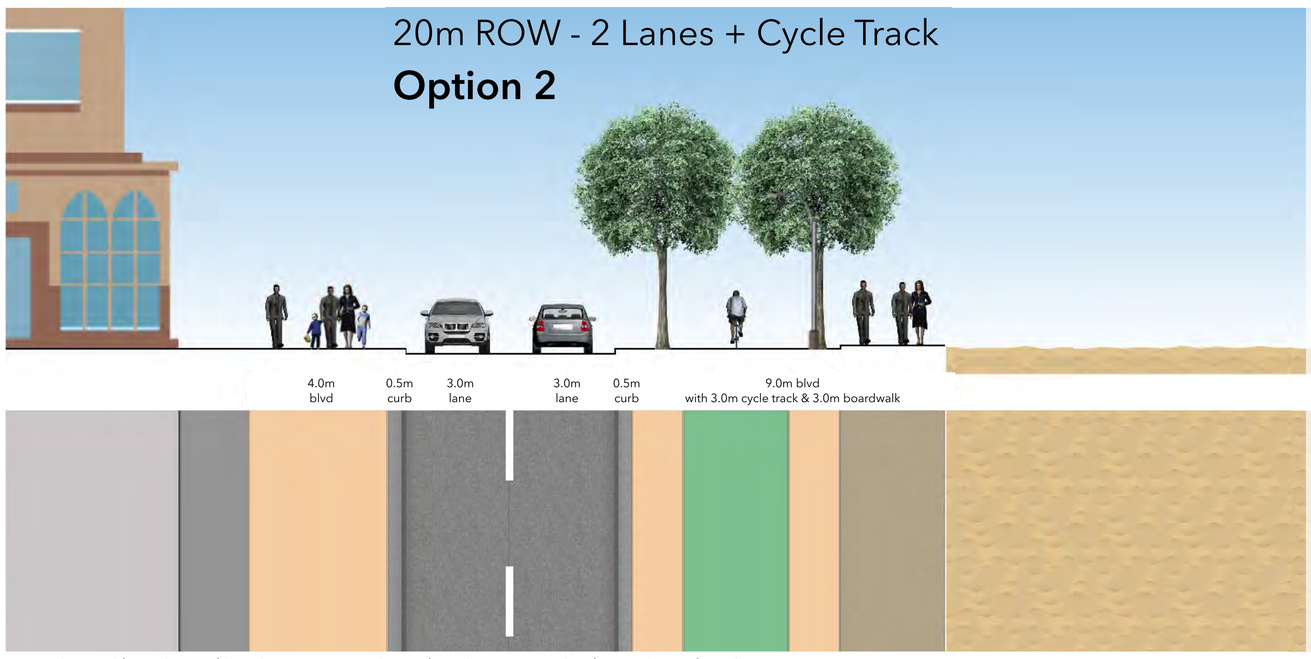
ALTERNATIVE SOLUTIONS - BEACH DRIVE

RIGHT-OF-WAY	VEHICLES	PARKING	BICYCLES	PEDESTRIANS COMMERCIAL
▪ 23m as proposed in the UDM ▪ consider 20m to reduce footprint and maximize development area	▪ consider 2 lanes ▪ Beach Drive is not a through road (only provides access to the Beach and abutting properties)	▪ eliminate parking to reduce conflicts ▪ municipal off-street parking is expected ▪ recognize limited right-of-way	▪ consider bicycle facilities ▪ serves as an alternative route to Mosley Street	▪ combine pedestrian & commercial zone ▪ maximize space ▪ greatest pedestrian demands on beach



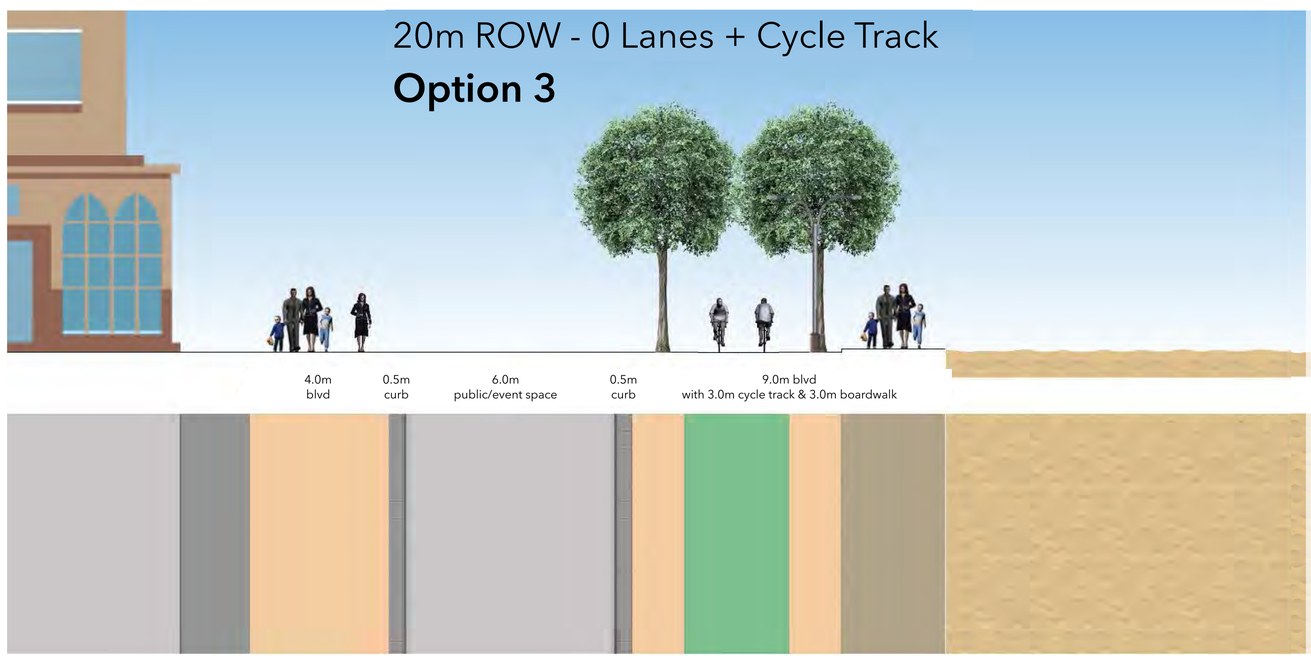
- 23m right-of-way and cross-section as recommended in the Urban Design Guidelines (UDG).
- With the provision of municipal off-street parking to be provided in the area, there is no need to provide on-street parking along Beach Drive, thereby reducing the overall cross-section width. This allows the space to be utilized for the public realm.
- A shoreline protection zone can be incorporated into the boardwalk.

Note: the need for and type of shoreline protection to be confirmed



- Under Option 2, the right-of-way is reduced to 20m to maximize the remaining land for either public beach use or development use.
- Travel lanes have been reduced from 3.5 to 3.0m in context of the "local" nature of the road. Boulevards have also been reduced.
- The multi-use trail as been reconfigured as a cycle track to eliminate conflict between cyclists and pedestrians (peds are to use the boardwalk).

Note: the need for and type of shoreline protection to be confirmed; minimum right-of-way to be confirmed



- Under Option 3, Beach Drive is closed to vehicular traffic thereby removing vehicles from the corridor and eliminating conflicts with other users.
- The "road corridor" space will remain, to be utilized by the public, for event staging and for service or emergency vehicles as required.
- The multi-use trail has been reconfigured as a cycle track to eliminate conflict between cyclists and pedestrians (peds are to use the boardwalk).

Note: the need for and type of shoreline protection to be confirmed; minimum right-of-way to be confirmed

Beach Drive - Alternative Solutions

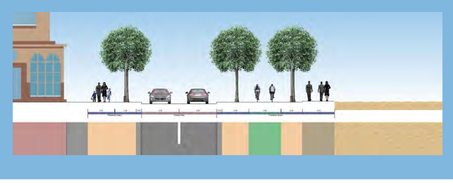
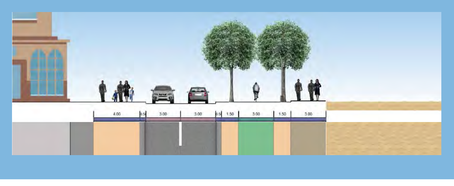
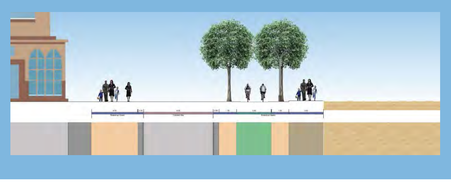
These solutions are intended to illustrate the desired elements within the ultimate Beach Drive cross-section and the overall relationship of each.

The configuration and composition of the boulevards (which are to include buffer space, amenity zones, pedestrian through zones and retail/commercial zones) are for illustration purposes only.

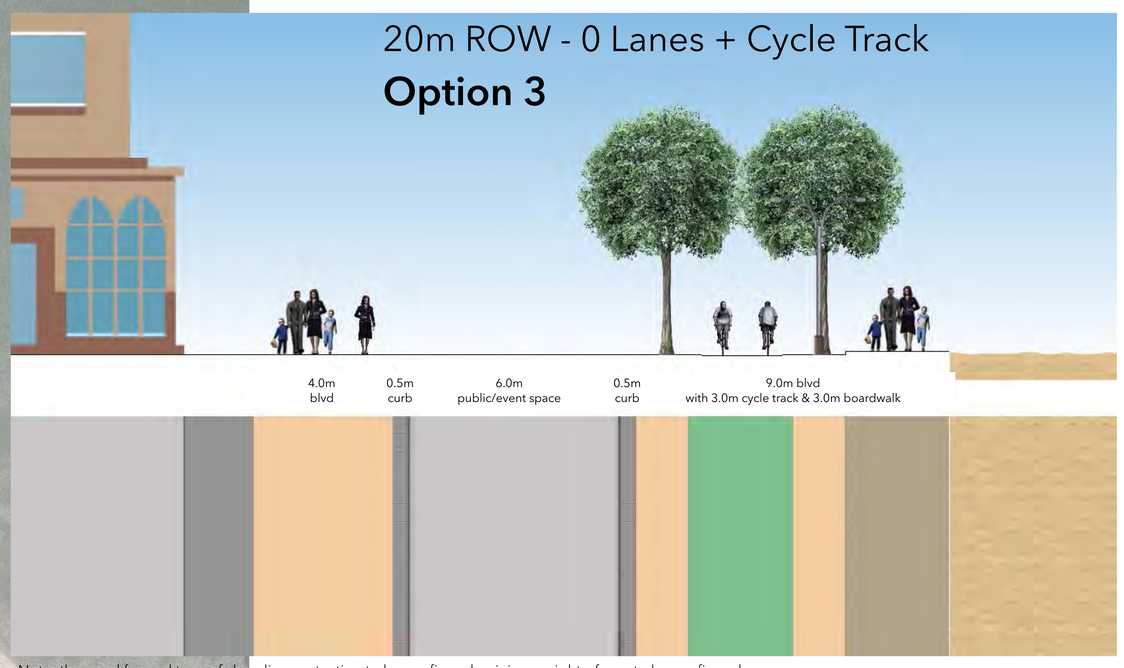
The next phase of the study will advance the Preferred Solution for Beach Drive and develop Alternative Design Concepts for it, with greater details as to dimensions, arrangements, landscape and streetscape, materials, etc.

What is presented here are only preliminary representations.

ASSESSMENT OF ALTERNATIVE SOLUTIONS - BEACH DRIVE

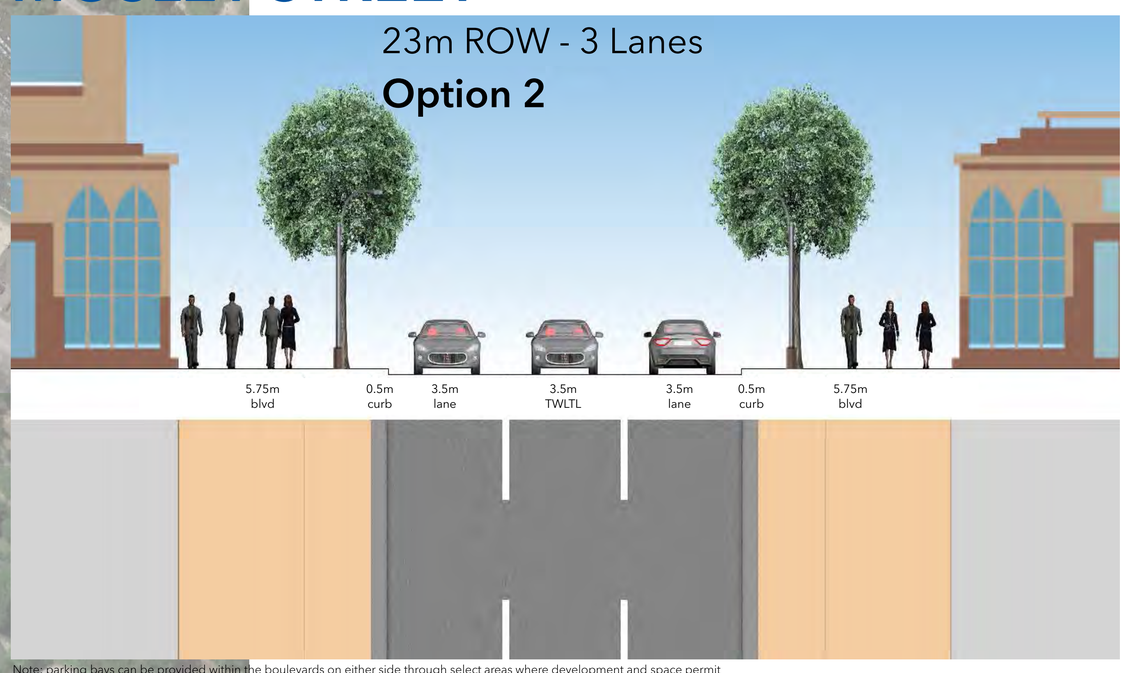
	Evaluation Criteria	How Criteria is Being Assessed	Option 1 	Option 2 	Option 3 
Transportation	Vehicles	Ability to accommodate future traffic volumes	✓ Will accommodate future volumes	✓ Will accommodate future volumes	▪ No vehicular access
	Parking	Ability to service abutting retail/ commercial	× No on-street parallel parking provided	× No on-street parallel parking provided	× No on-street parallel parking provided
	Cyclists	Cycling operation and safety	▪ Good operations/safety given separated and dedicated cycle track	▪ Good operations/safety given separated and dedicated cycle track	✓ Best operations/safety for cyclists given closure of Beach Drive to vehicular traffic
	Pedestrians	Pedestrian operation and safety along study corridor	▪ Wider sidewalks provide good accommodation for increased pedestrian volumes	• Wide sidewalks provide good accommodation for increased pedestrian volumes	✓ Best operations/safety for cyclists given closure of Beach Drive to vehicular traffic
	Promote AT	Likelihood to promote and foster Active Transportation use	▪ Good potential to promote Active Transportation	▪ Good potential to promote Active Transportation	✓ Greatest potential to promote Active Transportation
Natural Environment	Fisheries / Aquatic Impacts	Impact to fish habitat and other aquatic features	▪ Impacts to natural environment to be similar for all alternatives		
	Wildlife / Terrestrial Impacts	Impact to wildlife species	▪ Impacts to natural environment to be similar for all alternatives		
	Vegetation Impacts	Impact to vegetation communities on adjacent properties	▪ Impacts to natural environment to be similar for all alternatives		
Social Environment	Property Impacts	Impacts to property based on widening of road platform and/or ROW	× Greatest impact to store front properties due to 23m ROW	▪ Least impact impact to store front properties due to 20m ROW	▪ Least impact to store front properties due to 20m ROW
	Construction Impacts	Future impacts to adjacent properties	▪ Impacts similar across all options ▪ Minor, short-term, impacts during construction		
	Community Building	Opportunity for placemaking and enhanced access to public attraction	▪ Good opportunity to enhance Beach Area	▪ Good opportunity to enhance Beach Area	✓ Best opportunity to enhance Beach Area and increase access.
Cultural Heritage	Archaeological & Heritage Impacts	Impacts to cultural and heritage features	× Greatest potential impact to heritage features due to 23m ROW	▪ Least potential impact to heritage features due to 20m ROW (comparable to Option 3)	▪ Least potential impact to heritage features due to 20m ROW (comparable to Option 2)
Economic Environment	Construction Costs	Costs to construct individual options	× Greatest cost to construct as compared to other 2-lane options	▪ Lower cost to construct	✓ Lowest cost to construct
	Maintenance Costs	Future maintenance requirements	× Greatest cost to maintain	▪ Lower cost to maintain	✓ Lowest cost to maintain
	Land Acquisition Costs	Total land acquisition costs	× Greatest land acquisition costs due to 23m ROW	▪ Least land acquisition costs (comparable to Option 3)	▪ Least land acquisition costs (comparable to Option 2)
	Economic Opportunities	Retail & Commercial Enhancements	▪ Good opportunity for commercial engagement with public due to wide boulevards	▪ Good opportunity for commercial engagement with public due to wide boulevards	✓ Greatest opportunity for commercial engagement with public due to closure to vehicular traffic and increased pedestrian activity

BEACH DRIVE



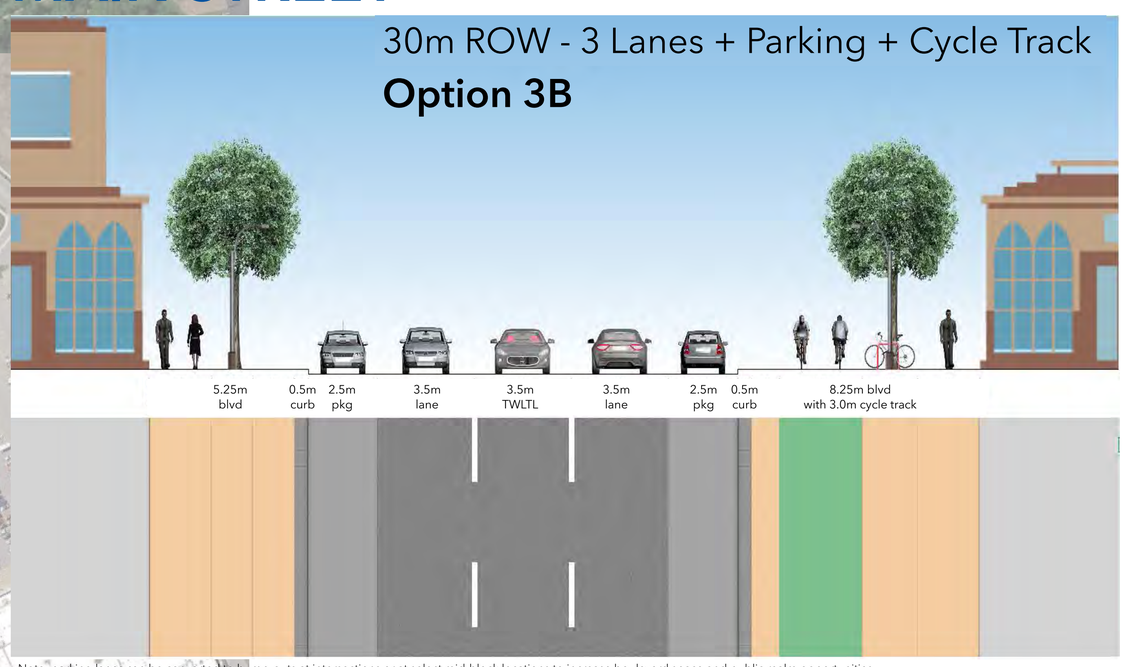
Note: the need for and type of shoreline protection to be confirmed; minimum right-of-way to be confirmed

MOSLEY STREET



Note: parking bays can be provided within the boulevards on either side through select areas where development and space permit

MAIN STREET



Note: parking lanes can be converted to bump-outs at intersections or at select mid-block locations to increase boulevard space and public realm opportunities

TOWN OF WASAGA BEACH INCORPORATED 1974

Main Street and Beach Areas 1 & 2 Improvements

RECOMMENDED SOLUTIONS

TATHAM ENGINEERING

ENVISIONTATHAM

PREFERRED SOLUTIONS

- All public comments will be reviewed and summarized.
- The development of the Alternative Solutions for each road will be revisited and additional options and/or modifications to existing options will be considered, as necessary.
- The assessment of the Alternative Solutions for each road will be revisited in context of the public comments and updated, as necessary.
- A Preferred Solution for each road will be identified and will serve as the basis for the next phase of the study.
- A Phases 1 & 2 Class EA Report will be prepared to document the process to date and complete Phase 2 of the Class EA process.

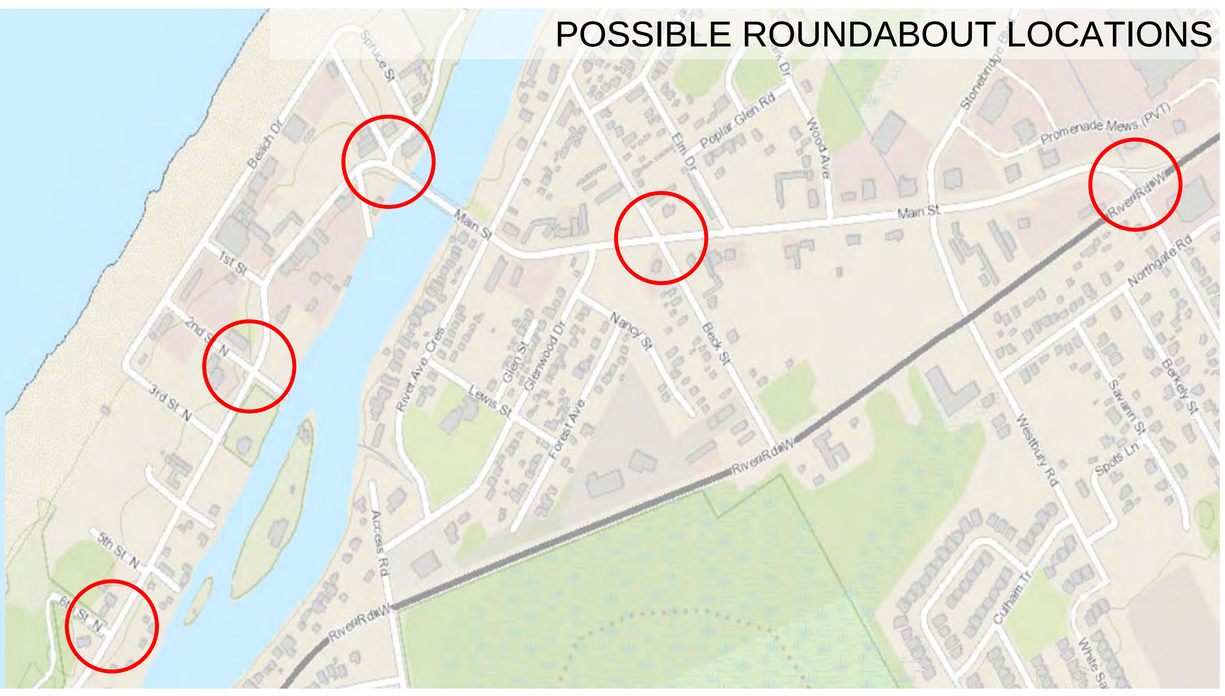
ALTERNATIVE DESIGN CONCEPTS

- Proceed to Phase 3 of the Class EA process.
- For each Preferred Solution for each road, Alternative Design Concepts will be prepared to further refine and define the cross-section.
- The Design Concepts will further consider and explore such things as:
  - sizes and dimensions of the noted components (eg. drive lanes, parking lanes, cycle tracks, etc.)
  - configuration and placement of elements within the boulevard (eg. amenity/utility corridors, pedestrian travel lanes, retail/commercial zones, etc.)
  - streetscape and landscape features and materials

ROUNDABOUTS

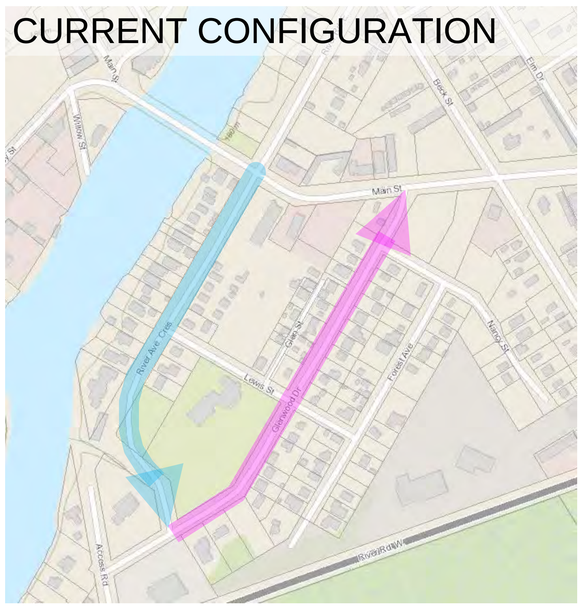
- The feasibility of implementing roundabouts at select study area intersections will be reviewed.
- Roundabouts have several safety, environmental, aesthetic and operational benefits over traditional intersections, and are becoming more prevalent in revitalization projects.
- Roundabouts also provide the opportunity to develop gateway features upon entry to a particular area and can also serve to announce arrival at a destination.

POSSIBLE ROUNDABOUT LOCATIONS



RIVER AVENUE CRESCENT & GLENWOOD DRIVE

CURRENT CONFIGURATION



- Currently, River Avenue Crescent is one-way southbound between Main Street and Glenwood Drive, whereas Glenwood Drive is one-way northbound between River Avenue Crescent and Main Street.
- The remaining space on River Avenue Crescent has been converted to bike lanes (one on each side); Glenwood Drive has a narrow paved shoulder on one side.
- The configuration of these streets will be reviewed in context of the overall area transportation needs, with due consideration for their intersections with Main Street. Alternative solutions to be considered include:
- maintain the existing configuration
- convert both to two-way operations (which would result in elimination of the dedicated bike lanes on River Avenue Crescent)

PUBLIC INFORMATION CENTRE 2

- Public Information Centre 2 will be scheduled for Spring 2020.
- Notices will be posted in the newspaper and Town website, and emailed to those on the mailing list).
- The Alternative Design Solutions and corresponding recommendations will be presented for public review and comment.
- Findings and recommendations from the continued transportation analyses regarding roundabouts and River Avenue Crescent and Glenwood Drive will be presented.

PIC 1 Summary of Public Comments

Respondent	Q2 Ped Facilities			Q3 Cyclist Facilities			Q4 On-Street Pkg			Q5 Close Beach		Q6 Main Cross-Section							
	Main	Mos	Beach	Main	Mos	Beach	Main	Mos	Beach	Y	N	Quo	1	2A bike lane	2B cycle track	3A bike lane	3B cycle track	Other	
1	VI	VI	VI	VI	VI	NI	NI	NI	NI	x							x		
2	I		VI	I		VI				x									
3	I	I	VI	I	NI	NI	NI	NI	NI	x							x		
4	VI	VI	VI	I	I	VI	NI	NI	NI	x							x		
5	VI	VI	VI	VI	VI	I	I	NI	NI	x					x				
6	VI	VI	VI	I	NI	NI	I	NI	NI	x							x		
7	VI		VI	VI	VI	VI	NI	NI	NI										no parking
8	VI	VI	VI	I	NI	NI	NI	NI	I	x								x	3A with no pkg
9	VI	VI	VI	VI	VI	VI	NI	NI	NI	x						x			
10	VI	I	VI	VI	VI	VI	NI	NI	NI	x								x	3B with no pkg
11	VI	VI	I	NI	NI	NI	NI	NI	I		x					x			
12	VI	VI	I	NI	NI	NI	NI	NI	I		x	x							
13	VI	VI	VI	VI	VI	VI	I	NI	I	x							x		
14	VI	I	VI	VI	I	VI	I	NI	NI	x						x			
15	VI	VI	VI	I	I	I	I	NI	NI	x							x		
16	VI	VI	VI	VI	VI	VI			NI								x		
17	VI	VI	VI	I	I	I	NI	NI	NI	x								x	3B with no pkg
18	I	I	VI	I	I	VI	I	VI	NI									x	3B with no pkg
19	VI	VI	i	I	I	NI	I	NI	I	x								x	
20	I	I	VI	I	I	I	NI	NI	I		x							x	3A with no pkg
21	I	I	VI	VI	VI	VI	NI	NI	NI		x							x	3A with no pkg
very important	16	13	18	9	8	10	0	1	0	14	4	1	0	0	1	3	7	7	
important	5	6	3	10	7	4	7	0	6	78%	22%	5%	0%	0%	5%	16%	**37%**	**37%**	
not important	0	0	0	2	5	7	12	18	14	18					19				

PIC 1

Respondent	Q7 Mosley Cross-Section							Q8 Beach Cross-Section					
	Quo	1	2	3	4A	4B	Other	Quo	1	2	3	Other	
					bike lane	cycle track			trail	cycle track	close		
1							x					x	boardwalk only
2											x		
3						x					x		
4			x								x		
5						x					x		
6						x					x		
7		x						x					
8							x				x		
9					x						x		
10					x						x		
11			x						x				
12			x						x				
13						x					x		
14					x						x		
15			x								x		
16						x					x		
17						x					x		
18						x					x		
19		x											
20		x										x	1 lane 1 way + ped + cycle
21		x										x	close in summer
very important	0	4	4	0	3	7	2	1	2	0	14	3	
important	0%	20%	20%	0%	15%	**35%**	10%	5%	10%	0%	**70%**	15%	
not important				20						20			

Main Street and Beach Area 1&2 Improvements
Municipal Class Environmental Assessment Study
Public Information Centre (PIC) 1 – February 6, 2020

TATHAM ENGINEERING

COMMENT SHEET (please print)

Please check the category that best describes your interest in the study:

☑ resident ☐ business owner ☐ agency or authority ☐ other

How important to you is it to have enhanced pedestrian facilities (eg. wider sidewalks or boardwalks) on:

* All of Mosley St is not utilized the same

Main Street	☐ very important	☑ important	☐ not important
Mosley Street	☐ very important	☐ important varies east end	☐ not important
Beach Drive	☑ very important	☐ important vs. west	☐ not important

How important to you is it to have dedicated cyclist facilities (eg. bike lanes or cycle tracks) on: safer * if dedicated

Main Street	☐ very important	☑ important	☐ not important
Mosley Street	☐ very important	☐ important	☐ not important varies
Beach Drive	☑ very important	☐ important	☐ not important

How important to you is it to have on-street parking on: Main St. Mosley don't have it so I don't see reason to add

Main Street	☐ very important	☐ important	☐ not important
Mosley Street	☐ very important	☐ important	☐ not important
Beach Drive shuttle?	☐ very important	☐ important	☐ not important

Should Beach Drive be closed to motor vehicles (ie. pedestrians only)? safer ☑ yes ☐ no But

What do you feel is the most appropriate solution for Main Street? we need a shuttle service for Beach Dr

* IF MAIN STREET CHANGES AS ANTICIPATED CANNOT MAINTAIN STATUS QUO

☐ Maintain the status quo

☐ Option 1 2 lanes + on-street parking on 2 sides + multi-use trail on 1 side + 5.75m blvds in a 30m ROW — sorry multi use includes bikes & dangerous result

☐ Option 2A 2 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 6.5m blvds in a 30m ROW

☐ Option 2B 2 lanes + on-street parking on 2 sides + cycle track + 7.0m blvds in a 30m ROW

☐ Option 3A 3 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 4.75m blvds in a 30m ROW — no? walking or gather all of this maintains pedestrian areas

☐ Option 3B 3 lanes + on-street parking on 2 sides + cycle track + 5.25m blvds in a 30m ROW

☐ Other (please detail)

I have too many concerns to choose an Option

7. What do you feel is the most appropriate solution for Mosley Street? * MOSLEY is not the same all the way thru town so I feel this does not apply to all of Mosley either

☐ Maintain the status quo

☐ Option 1 2 lanes + multi-use trail on 1 side + 6.0m blvds in a 23m ROW

☐ Option 2 3 lanes + 5.75m blvds in a 23m ROW

☐ Option 3 3 lanes + on-street parking on 2 sides + 3.25m blvds in a 23m ROW

☐ Option 4A 3 lanes + bike lanes on 2 sides + 4.25m blvds in a 23m ROW

☐ Option 4B 3 lanes + cycle track + 4.25m blvds in a 23m ROW

☐ Other (please detail)

are thes varying sizes of Blvds to incl pedestrian thoroughfare ?

I've too many concerns to choose an option

Thank you for having our residents so involved.

8. What do you feel is the most appropriate solution for Beach Drive?

- ☐ Maintain the status quo
- ☐ Option 1 — 2 lanes + multi-use trail and boardwalk on 1 side + 4.5m blvd in a 23m ROW
- ☐ Option 2 — 2 lanes + cycle track and boardwalk + 4.0m blvd in a 20m ROW (reduced from 23m ROW)
- ☑ Option 3 — 0 lanes (closed to vehicles) + cycle track and boardwalk + 4.0m blvd in a 20m ROW (reduced from 23m)
- ☐ Other (please detail)

my only concern is for those who cannot walk any distance may not get here without vehicles

9. Do you have any comments on the potential for roundabouts at select study area intersections?

Once our Residents adjusted they seem to work well & we know its proven to be the best choice

10. Do you have any comments on the operations of River Avenue Crescent and Glenwood Drive (one-way vs two-way)?

11. Please provide any additional comments as appropriate to assist the Town and Project Team.

Thank you for your input. Please submit at the PIC or mail/email/fax by **February 29, 2020** to:

Michael Cullip, P.Eng.
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
mcullip@tathameng.com
tel: (705) 444-2565 fax: (705) 444-2327

The information on this comment sheet is collected under the authority of the Environmental Assessment Act and will become public information. All comments will be included in the Class Environmental Assessment documentation to be made public at the conclusion of this project.

Please check the space below if you wish your comments to be made anonymously.

☐ Please withhold my name and address from publication

Main Street and Beach Area 1&2 Improvements
Municipal Class Environmental Assessment Study
Public Information Centre (PIC) 1 – February 6, 2020

TATHA ENGINEERI

COMMENT SHEET (please print)

1. Please check the category that best describes your interest in the study:

☑ resident ☐ business owner ☐ agency or authority ☐ other

2. How important to you is it to have enhanced pedestrian facilities (eg. wider sidewalks or boardwalks) on:

Main Street	☑ very important	☐ important	☐ not important
Mosley Street	☐ very important	☐ important	☐ not important
Beach Drive	☑ very important	☐ important	☐ not important

3. How important to you is it to have dedicated cyclist facilities (eg. bike lanes or cycle tracks) on:

Main Street	☐ very important	☐ important	☐ not important
Mosley Street	☐ very important	☐ important	☐ not important
Beach Drive	☑ very important	☐ important	☐ not important

4. How important to you is it to have on-street parking on:

Main Street	☐ very important	☐ important	☐ not important
Mosley Street	☐ very important	☐ important	☐ not important
Beach Drive	☐ very important	☐ important	☐ not important

5. Should Beach Drive be closed to motor vehicles (ie. pedestrians only)? ☐ yes ☐

6. What do you feel is the most appropriate solution for Main Street?

☐ Maintain the status quo

☐ Option 1 2 lanes + on-street parking on 2 sides + multi-use trail on 1 side + 5.75m blvds in a 30m ROW

☐ Option 2A 2 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 6.5m blvds in a 30m ROW

☐ Option 2B 2 lanes + on-street parking on 2 sides + cycle track + 7.0m blvds in a 30m ROW

☐ Option 3A 3 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 4.75m blvds in a 30m ROW

☐ Option 3B 3 lanes + on-street parking on 2 sides + cycle track + 5.25m blvds in a 30m ROW

☐ Other (please detail)

What do you feel is the most appropriate solution for Mosley Street?

8. What do you feel is the most appropriate solution for

☐ Maintain the status quo

☐ Option 1 2 lanes + multi-use trail and boardwalk on 1 side + 4.5m blvd in a 23m ROW

☐ Option 2 2 lanes + cycle track and boardwalk + 4.0m blvd in a 20m ROW (reduced from 23m ROW)

☐ Option 3 0 lanes (closed to vehicles) + cycle track and boardwalk + 4.0m blvd in a 20m ROW (reduced from 23m)

☐ Other (please detail)

9. Do you have any comments on the potential for roundabouts at select study area intersections?

10. Do you have any comments on the operations of River Avenue Crescent and Glenwood Drive (one-way vs two-way)?

11. Please provide any additional comments as appropriate to assist the Town and Project Team.

THIS IS ONE BIG WASTE OF TIME. WE HAD A DTMP.
HOW CAN "WE" DESIGN ROADS/WALKWAYS WHEN WE DON'T
KNOW WHAT THE STREETSCAPE WILL LOOK LIKE.
I DO CARE IF IN THIS PLAN: WHEN CROSSING "THE BRIDGE"
~~will~~ you HAVE A CLEAR VIEW OF "THE BAY"?! I HOPE
ALSO I WOULD APPRECIATE KNOWING HOW MANY RESIDENTS
HAVE TAKEN THE TIME ~~or~~ TO REPLY.

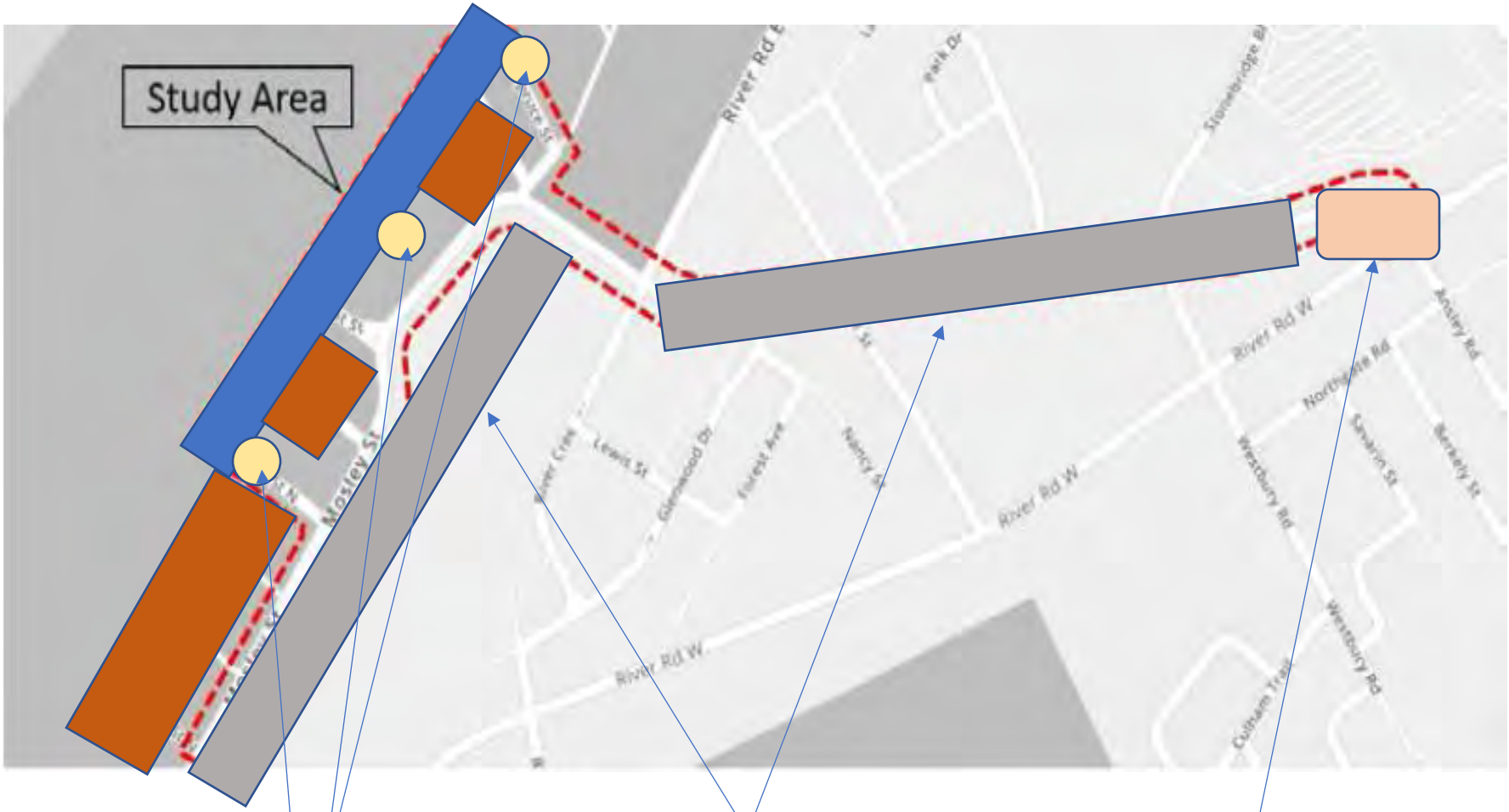
Thank you for your input. Please submit at the PIC or mail/email/fax by **February 29, 2020** to:

Michael Cullip, P.Eng.
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
mailto:mcullip@tathameng.com
tel: (705) 444-2565 x2020 fax: (705) 444-2327

The information on this comment sheet is collected under the authority of Environmental Assessment Act and will become public information. All comments be included in the Class Environmental Assessment documentation to be made p at the conclusion of this project.

Please check the space below if you wish your comments to be made anonymously.

☐ Please withhold my name and address from publication



Drop off locations no parking. Can be decorated with statues. Ensure many pedestrian walks.

Road should include pedestrian walk to allow walking and biking. Streets should be lined with store fronts and apartment above for both permanent residences and vacation rentals. Permanent apartments would allow year round use.

Town square or starting point gathering areas

Notes :

The blue area on the beach represents an area which I believe needs to be addressed. The road should be removed to allow it to be raised 8 feet as a mitigation for rising water levels. A pedestrian square area could benefit from this design allowing for gatherings and venues. Addition of a small wall on top would provide further protections and allow common areas for tourist to gather. Additionally, wind mitigation through structures and trees could further provide protection from the elements in all seasons. The buildings should be moved closer to Mosley and utilize a court yard design to facilitate use during winter and drop off zones for resort and hotel accommodations along beach front.

The copper coloured areas represent hotels and conference facilities that could used by tourist and others looking for venues such as weddings, Christmas village, and fall exploration. Winter promotional activities for cross country skiing, skidoos events could utilizer the accommodations, as well as corporate events.

Hopefully you can or have utilized some of these types of ideas in your planning.

Main street revitalization public input

1 attachments (265 KB)
downtown plan.docx;

Hello,

I am submitting the following information as my public input for the main st. revitalization plan meeting unfortunately i cannot attend to provide feedback. but have made some notes of what i would like to see in the plan. unfortunately i don't have the artistic capabilities to further my vision. i hope that my input might influence some the decisions or at least create awareness to some of the obstacles.

Thank you

FW: Main Street Reconstruction

Mike Latimer <m.latimer@wasagabeach.com>

Tue 2/4/2020 2:01 PM

To: Michael Cullip <mcullip@tathameng.com>

Kind Regards,

Mike Latimer, C.E.T.
Project/Transit Coordinator
Public Works Department
Town of Wasaga Beach
705-429-2540 ext. 2342
m.latimer@wasagabeach.com

-----Original Message-----

[CAUTION: Outside email]

Thanks!

General input. Just in case you didn't have enough already ;)

The more space for walking where bikes and cars won't kill us the better. Pedestrian only areas with shops and cafes encourage lingering and spending. Green medians with trees and planters always feels more friendly. An open air trolley car along main and Moseley should be considered. Tourist love them. They put one in place down at Fort Myers Beach for a while and everyone we talked to there thought they were a great idea. Closing the road in front of beach one to everything but pedestrians, bikes and the trolley would reduce noise and congestion and perhaps allow some of the road to be reclaimed as beach.
Free shuttle from further out parking would allow the close to beach parking to be repurposed.

> On Feb 4, 2020, at 2:00 PM, Mike Latimer <m.latimer@wasagabeach.com> wrote:
>
> Hi Rick,
>
> Thanks for reaching out.
>
> The PIC Boards will be posted on the Towns Website soon after the public meeting during the 30 day comment period.
>
> Kind Regards,
>
> Mike Latimer, C.E.T.
> Project/Transit Coordinator
> Public Works Department
> Town of Wasaga Beach
> 705-429-2540 ext. 2342
> m.latimer@wasagabeach.com
>
> -----Original Message-----

>
> [CAUTION: Outside email]
>
> Hi Mike,
>
> We are not able to attend the meeting on Thursday. Are the materials to be presented available online?
>
> Regards,

Main Street and Beach Area 1&2 Improvements
Municipal Class Environmental Assessment Study
Public Information Centre (PIC) 1 – February 6, 2020

TATHAM ENGINEERING

COMMENT SHEET (please print)

1. Please check the category that best describes your interest in the study:

■ resident ☐ business owner ☐ agency or authority ☐ other

2. How important to you is it to have enhanced pedestrian facilities (eg. wider sidewalks or boardwalks) on:

Main Street	■ very important	☐ important	☐ not important
Mosley Street	■ very important	☐ important	☐ not important
Beach Drive	■ very important	☐ important	☐ not important

3. How important to you is it to have dedicated cyclist facilities (eg. bike lanes or cycle tracks) on:

Main Street	■ very important	☐ important	☐ not important
Mosley Street	■ very important	☐ important	☐ not important
Beach Drive	☐ very important	☐ important	■ not important

4. How important to you is it to have on-street parking on:

Main Street	☐ very important	☐ important	■ not important
Mosley Street	☐ very important	☐ important	■ not important
Beach Drive	☐ very important	☐ important	■ not important

5. Should Beach Drive be closed to motor vehicles (ie. pedestrians only)? ■ yes ☐ no

6. What do you feel is the most appropriate solution for Main Street?

☐ Maintain the status quo

☐ Option 1 2 lanes + on-street parking on 2 sides + multi-use trail on 1 side + 5.75m blvds in a 30m ROW

☐ Option 2A 2 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 6.5m blvds in a 30m ROW

☐ Option 2B 2 lanes + on-street parking on 2 sides + cycle track + 7.0m blvds in a 30m ROW

☐ Option 3A 3 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 4.75m blvds in a 30m ROW

☐ Option 3B 3 lanes + on-street parking on 2 sides + cycle track + 5.25m blvds in a 30m ROW

■ Other (please detail) 3B with a modification. Replace the TWLTL lane with a green centre median with left turn lanes at select locations only. The green median enhances the look and feel plus gives slower moving pedestrians a place to pause.

7. What do you feel is the most appropriate solution for Mosley Street?

☐ Maintain the status quo

☐ Option 1 2 lanes + multi-use trail on 1 side + 6.0m blvds in a 23m ROW

☐ Option 2 3 lanes + 5.75m blvds in a 23m ROW

☐ Option 3 3 lanes + on-street parking on 2 sides + 3.25m blvds in a 23m ROW

☐ Option 4A 3 lanes + bike lanes on 2 sides + 4.25m blvds in a 23m ROW

☐ Option 4B 3 lanes + cycle track + 4.25m blvds in a 23m ROW

■ Other (please detail) Option 1 because I don't think there should be bike lane along Beach Dr. There are too many pedestrians and cyclists believe it or not are not as cautious of pedestrians as automobiles. Mosley shouldn't need parking. Option 1 encourages foot traffic and browsing.

8. What do you feel is the most appropriate solution for Beach Drive?

☐ Maintain the status quo

☐ Option 1 2 lanes + multi-use trail and boardwalk on 1 side + 4.5m blvd in a 23m ROW

☐ Option 2 2 lanes + cycle track and boardwalk + 4.0m blvd in a 20m ROW (reduced from 23m ROW)

☐ Option 3 0 lanes (closed to vehicles) + cycle track and boardwalk + 4.0m blvd in a 20m ROW (reduced from 23m)

■ Other (please detail) Get rid of the roadway. Bring beach one back to the middle of the current Beach Road so there is more beach to accomodate the people who are coming to Wasaga BEACH. Build a break wall there with a wide boardwalk. No bike path. No event space. Just the board walk.

9. Do you have any comments on the potential for roundabouts at select study area intersections?

Beck and Main is probably good. I don't agree with one at Main/Mosely/Janetta. The Main/Mosely/Janetta should be a set of lights with a “left” turn from Mosely to Janetta. Eastbound motorists would need to go to the Beck/Main roundabout and come back down to turn right onto Janetta. This would eliminate a lot of the backup onto Mosely and eliminate the need for a circle in this prime real estate location. No comment on the other locations. Generally I feel roundabouts work as a substitute for stop signs (especially in residential developments) and where main roads meet in rural areas. I don't feel they work well in urban settings where traffic is heavy (as it would be at Main/Mosely/Janetta). Cars invariably have to come to a stop and traffic can be unbalanced. Eliminating the conflict of the left from Mosely to Janetta would enable a flow that is easily managed by traffic lights without consuming the land area of a roundabout. Roundabouts are also not pedestrian friendly and this location has a lot of foot traffic.

10. Do you have any comments on the operations of River Avenue Crescent and Glenwood Drive (one-way vs two-way)?

I believe that one way streets help with the flow of traffic as does eliminating left turns. Parking could be allowed along these streets with the spots closest to Main reserved for seniors and handicap.

11. Please provide any additional comments as appropriate to assist the Town and Project Team.

We need at least one, probably two, more bridges from River Rd across to Mosley to aleviate the congestion of both Mosely and the Main St bridge. Parking away from Beach One should be increased, perhaps even considering a multi-level structure, and then a shuttle service provided to each of the Beach 1-4 Areas. End points could be at Mosley & River (near McDonalds) and at Main and Beck (parking lot). Free for up to 5 with parking receipt. Nominal feel for daily pass. Weekly and Seasonal passes should also be available. Could be other “hop on, hop off" stops at points of interest along the route. Should be open air electric cars. Want to decongest the beach areas by converting parking to more useful space and encouraging patrons to visit different sections without having to worry about finding parking. A separate loop could go from McD’s to Beach 5, the YMCA, Beach 6 and the SuperCentre plaza.

[redacted]

Thank you for your input. Please submit at the PIC or mail/email/fax by **February 29, 2020** to:

Michael Cullip, P.Eng.
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
mailto:mcullip@tathameng.com
tel: (705) 444-2565 x2020 fax: (705) 444-2327

The information on this comment sheet is collected under the authority of the Environmental Assessment Act and will become public information. All comments will be included in the Class Environmental Assessment documentation to be made public at the conclusion of this project.

Please check the space below if you wish your comments to be made anonymously.

■ Please withhold my name and address from publication

Main Street and Beach Area 1&2 Improvements
Municipal Class Environmental Assessment Study
Public Information Centre (PIC) 1 – February 6, 2020

TATHAM ENGINEERING

COMMENT SHEET (please print)

1. Please check the category that best describes your interest in the study:

☑ resident ☐ business owner ☐ agency or authority ☐ other

2. How important to you is it to have enhanced pedestrian facilities (eg. wider sidewalks or boardwalks) on:

Main Street	☐ very important	☑ important	☐ not important
Mosley Street	☐ very important	☑ important	☐ not important
Beach Drive	☑ very important	☐ important	☐ not important

3. How important to you is it to have dedicated cyclist facilities (eg. bike lanes or cycle tracks) on:

Main Street	☐ very important	☑ important	☐ not important
Mosley Street	☐ very important	☐ important	☑ not important
Beach Drive	☐ very important	☐ important	☑ not important

4. How important to you is it to have on-street parking on:

Main Street	☐ very important	☐ important	☑ not important
Mosley Street	☐ very important	☐ important	☑ not important
Beach Drive	☐ very important	☐ important	☑ not important

5. ~~Should Beach Drive be closed to motor vehicles (ie. pedestrians only)?~~ ☑ yes ☐ no

6. What do you feel is the most appropriate solution for Main Street?

☐ Maintain the status quo

☐ Option 1 2 lanes + on-street parking on 2 sides + multi-use trail on 1 side + 5.75m blvds in a 30m ROW

☐ Option 2A 2 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 6.5m blvds in a 30m ROW

☐ Option 2B 2 lanes + on-street parking on 2 sides + cycle track + 7.0m blvds in a 30m ROW

☐ Option 3A 3 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 4.75m blvds in a 30m ROW

☑ Option 3B 3 lanes + on-street parking on 2 sides + cycle track + 5.25m blvds in a 30m ROW

☐ Other (please detail)

7. What do you feel is the most appropriate solution for Mosley Street?

☐ Maintain the status quo

☐ Option 1 2 lanes + multi-use trail on 1 side + 6.0m blvds in a 23m ROW

☐ Option 2 3 lanes + 5.75m blvds in a 23m ROW

☐ Option 3 3 lanes + on-street parking on 2 sides + 3.25m blvds in a 23m ROW

☐ Option 4A 3 lanes + bike lanes on 2 sides + 4.25m blvds in a 23m ROW

☑ Option 4B 3 lanes + cycle track + 4.25m blvds in a 23m ROW

☐ Other (please detail)

8. What do you feel is the most appropriate solution for Beach Drive?

- ☐ Maintain the status quo
- ☐ Option 1 — 2 lanes + multi-use trail and boardwalk on 1 side + 4.5m blvd in a 23m ROW
- ☐ Option 2 — 2 lanes + cycle track and boardwalk + 4.0m blvd in a 20m ROW (reduced from 23m ROW)
- ☑ Option 3 — 0 lanes (closed to vehicles) + cycle track and boardwalk + 4.0m blvd in a 20m ROW (reduced from 23m)
- ☐ Other (please detail)

9. Do you have any comments on the potential for roundabouts at select study area intersections?

Beck St +/or River Road only
Tourists get confused with roundabouts.

10. Do you have any comments on the operations of River Avenue Crescent and Glenwood Drive (one-way vs two-way)?

One way works.

11. Please provide any additional comments as appropriate to assist the Town and Project Team.

lets get this going. Years & years of the same studies need to stop.

Thank you for your input. Please submit at the PIC or mail/email/fax by **February 29, 2020** to:

Michael Cullip, P.Eng.
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
mcullip@tathameng.com
tel: (705) 444-2565 fax: (705) 444-2327

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Main Street and Beach Area 1&2 Improvements
Municipal Class Environmental Assessment Study
Public Information Centre (PIC) 1 – February 6, 2020

TATHAM ENGINEERING

COMMENT SHEET (please print)

1. Please check the category that best describes your interest in the study:

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Mosley Street	☐ very important	☐ important	☑ not important
Beach Drive	☐ very important	☐ important	☑ not important

5. Should Beach Drive be closed to motor vehicles (ie. pedestrians only)? ☑ yes ☐ no

6. What do you feel is the most appropriate solution for Main Street?

☐ Maintain the status quo

☐ Option 1 2 lanes + on-street parking on 2 sides + multi-use trail on 1 side + 5.75m blvds in a 30m ROW

☐ Option 2A 2 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 6.5m blvds in a 30m ROW

☐ Option 2B 2 lanes + on-street parking on 2 sides + cycle track + 7.0m blvds in a 30m ROW

☐ Option 3A 3 lanes + on-street parking on 2 sides + bike lanes on 2 sides + 4.75m blvds in a 30m ROW

☑ Option 3B 3 lanes + on-street parking on 2 sides + cycle track + 5.25m blvds in a 30m ROW

☐ Other (please detail)

7. What do you feel is the most appropriate solution for Mosley Street?

☐ Maintain the status quo

☐ Option 1 2 lanes + multi-use trail on 1 side + 6.0m blvds in a 23m ROW

☑ Option 2 3 lanes + 5.75m blvds in a 23m ROW

☐ Option 3 3 lanes + on-street parking on 2 sides + 3.25m blvds in a 23m ROW

☐ Option 4A 3 lanes + bike lanes on 2 sides + 4.25m blvds in a 23m ROW

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☐ Other (please detail)

8. What do you feel is the most appropriate solution for Beach Drive?

- ☐ Maintain the status quo
- ☐ Option 1 — 2 lanes + multi-use trail and boardwalk on 1 side + 4.5m blvd in a 23m ROW
- ☐ Option 2 — 2 lanes + cycle track and boardwalk + 4.0m blvd in a 20m ROW *(reduced from 23m ROW)*
- ☑ Option 3 — 0 lanes (closed to vehicles) + cycle track and boardwalk + 4.0m blvd in a 20m ROW *(reduced from 23m)*
- ☐ Other (please detail)

9. Do you have any comments on the potential for roundabouts at select study area intersections?

- I Vote yes For Roundabouts!

10. Do you have any comments on the operations of River Avenue Crescent and Glenwood Drive (one-way vs two-way)?

-I think they should operate as two-way. I Personally Find the current one-way streets Confusing.

11. Please provide any additional comments as appropriate to assist the Town and Project Team.

1) Awesome presentation, Very interesting, Clear and Concise.

2) Keep up the great work!

Thank you for your input. Please submit at the PIC or mail/email/fax by **February 29, 2020** to:

Michael Cullip, P.Eng.
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
mcullip@tathameng.com
tel: (705) 444-2565 fax: (705) 444-2327

FW: Main Street / Beach Areas 1&2 EA - PIC#1 Boards

Mike Pincivero <pwengineer@wasagabeach.com>

Thu 1/23/2020 8:07 AM

To: Michael Cullip <mcullip@tathameng.com>
Cc: Kevin Lalonde <publicworksdirector@wasagabeach.com>; Mike Latimer <m.latimer@wasagabeach.com>

FYI

Regards,

Mike Pincivero, P.Eng.
Manager of Engineering Services, RMO/RMI

Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, Ontario
L9Z 1A1

Office: (705) 429-2540, ext. 2307
Fax: (705) 429-8226
Cell: (705) 441-4123
m.pincivero@wasagabeach.com

If you have any accommodation needs or require communication supports or alternate formats, please let me know.
Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

Thank you for your feedback and comments George.

Please note that yes, we will be looking at other intersection options and will not be assuming roundabouts as a preferred solution. Our consultant will be running traffic models to compare the suitability and function of un-signalized, signalized, and roundabout options for the key intersections as part of the evaluation of pros and cons for a preferred solution (for each of the intersections). The evaluation will consider more than just traffic movement though, as it will also have regard for the other modes of transportation and fit for the key locations. Property and cost will of course be factors as well.

Regards,

Mike Pincivero, P.Eng.
Manager of Engineering Services, RMO/RMI

Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, Ontario
L9Z 1A1

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Looks very professional Mike. I still have reservations about round a bouts and the amount of real estate that they require which leads to the purchasing of properties which becomes economically unfeasible. I can see one at the intersection of Main and RRW at Foodland but not any other spots along Main and Mosley through the main beach area. Are alternatives to round a bouts being offered or suggested? Thanks. George

Sent from Mail for Windows 10

From: Mike Pincivero
Sent: January 22, 2020 10:57 AM
To: Council
Cc: Kevin Lalonde
Subject: Main Street / Beach Areas 1&2 EA - PIC#1 Boards

Hello member of Council.

As you may have already noticed on this week's Coordinated Committee Agenda, we have included a notice for the Main Street / Beach Areas 1&2 EA - PIC#1 to be held February 6th from 7:00 to 9:00pm. The PIC will start with a presentation at 7:00pm followed by an open house format.

We have just received the boards that will on display at the PIC and wanted to share them with you prior to our CC meeting tomorrow – please see attached.

Kevin is not in the office today as he is under the weather, but please do not hesitate to contact me should you have any questions or comments.

Regards,

Mike Pincivero, P.Eng.
Manager of Engineering Services, RMO/RMI

Town of Wasaga Beach
30 Lewis Street

Wasaga Beach, Ontario
L9Z 1A1

Office: (705) 429-2540, ext. 2307
Fax: (705) 429-8226
Cell: (705) 441-4123
m.pincivero@wasagabeach.com

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20-14 IO has identified MOI property in study area - Main Street Reconstruction and Beach Area Revitalization

Kallideen, Raquel (IO) <Raquel.Kallideen@infrastructureontario.ca>

Thu 2/6/2020 3:33 PM

To: m.latimer@wasagabeach.com <m.latimer@wasagabeach.com>; Michael Cullip <mcullip@tathameng.com>

Good afternoon,

Thank you for sending us the Notice of Public Information Centre for the Main Street Reconstruction and Beach Area 1&2 Revitalization in the Town of Wasaga.

While our initial scan indicates that property owned by the Minister of Government and Consumer Services identified by PINs 583280081 and 583290099 might be within or adjacent to your project's study area, it is the proponent's responsibility to verify if provincial government property is within the study area. Title documents may identify owners of provincial government property as any of the following:

- His Majesty the King
- Her Majesty the Queen
- Hydro One
- Hydro One Networks Inc.
- Management Board Secretariat (MBS)
- Minister of Economic Development, Employment and Infrastructure (MEDEI)
- Minister of Energy and Infrastructure (MEI)
- Minister of Government and Consumer Services (MGCS)
- Minister of Infrastructure (MOI)
- Minister of Natural Resources and Forestry (MNRF)
- Minister of Public Infrastructure Renewal (PIR)
- Minister of Public Works
- Minister of Transportation (MTO)
- Ontario Lands Corporation (OLC)
- Ontario Realty Corporation (ORC)

If provincial government property in the study area is not required for the project, please continue to consult us as a directly affected stakeholder. However, if government property is required for the project, the proponent should contact us so that we can advise about requirements for obtaining government property.

Best,

Raquel Kallideen

Infrastructure Ontario

Raquel Kallideen (she, her)
Infrastructure Ontario
Environmental Management Co-op, Environmental Management

Raquel.Kallideen@infrastructureontario.ca
Office: 647-264-2745
www.infrastructureontario.ca

Follow IO at:

Wasaga Beach - Main Street Reconstruction and Beach Area 1&2 Revitalization - Class "C" EA

Mott, Ken (MNRF) <ken.mott@ontario.ca>

Tue 1/28/2020 2:46 PM

To: m.latimer@wasagabeach.com <m.latimer@wasagabeach.com>; Michael Cullip <mcullip@tathameng.com>

Mr. Latimer and Mr. Cullip;
As the above mentioned project goes forward MNRF would like to be circulated and provide comments as appropriate.

Regards,
Ken Mott

Ken Mott
District Planner | Midhurst District | Ministry of Natural Resources and Forestry | Bruce, Grey, Simcoe and Dufferin Counties
(705) 725-7546 |(705) 725-7584 |ken.mott@ontario.ca |

Main St. Reconstruction & Beach Area 1&2 Revitalization - MCEA

Pomeroy, Meghan (MECP) <Meghan.Pomeroy@ontario.ca>

Thu 1/30/2020 11:56 AM

To: Mike Latimer <m.latimer@wasagabeach.com>; Michael Cullip <mcullip@tathameng.com>
Cc: Pomeroy, Meghan (MECP) <Meghan.Pomeroy@ontario.ca>; Fisher, John (MECP) <John.Fisher@ontario.ca>; Dasti, Benjamin (MECP) <Benjamin.Dasti@ontario.ca>

Hello Mike and Michael,

Staff from Ontario Parks are not available to attend the public information centre for this MCEA study on February 6th; however, we are interested in this project and request:

- that publicly available information or presentations related to the MCEA study be sent to me, and
- to be added to the project mailing list to receive future notices and information.

My contact information is below; email communication is preferred.

We are particularly interested in any potential impacts to Wasaga Beach Provincial Park.

Thank you,

Meghan Pomeroy | Park Planner – Southwest Zone
1350 High Falls Road, Bracebridge, Ontario, P1L 1W9
P: 705-646-5520 **W:** OntarioParks.com

ONTARIO PARKS

Ministry of the Environment, Conservation and Parks
Please note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

RE: Main Street and Beach Areas 1 & 2 Class EA - MNRF input - 119067

Pomeroy, Meghan (MECP) <Meghan.Pomeroy@ontario.ca>

Mon 3/2/2020 9:44 AM

To: Mike Latimer <m.latimer@wasagabeach.com>; Michael Cullip <mcullip@tathameng.com>
Cc: Fisher, John (MECP) <John.Fisher@ontario.ca>; Dasti, Benjamin (MECP) <Benjamin.Dasti@ontario.ca>; Pomeroy, Meghan (MECP) <Meghan.Pomeroy@ontario.ca>

Hello Michael and Mike,

Thank you for providing an opportunity to comment on the Town of Wasaga Beach's Main St. reconstruction & downtown revitalization municipal Class EA (MCEA).

The MCEA study area is near or abuts part of Wasaga Beach Provincial Park. Potential impacts to provincial park lands must be carefully considered in light of Ontario Parks' legislated mandate to protect the park's natural, cultural and recreational values, and provide opportunities for ecologically sustainable recreation.

Some of the proposals put forward in the MCEA documents have the potential to affect access to Wasaga Beach Provincial Park. Additionally, the note about the possible need for shoreline protection along Beach Drive has the potential to affect the park directly; Ontario Parks recommends that consideration be given to natural shoreline protection features wherever possible (e.g., vegetated sand dunes).

We look forward to participating in future discussions when more detailed proposals are available. Please continue to provide MCEA notices and information to Meghan.Pomeroy@ontario.ca and John.Fisher@ontario.ca.

Thanks,

Meghan Pomeroy | Park Planner – Southwest Zone
1350 High Falls Road, Bracebridge, Ontario, P1L 1W9
P: 705-646-5520 **W:** OntarioParks.com

ONTARIO PARKS

Ministry of the Environment, Conservation and Parks
Please note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Michael Cullip <mcullip@tathameng.com>
Sent: February 7, 2020 10:51 AM
To: Pomeroy, Meghan (MECP) <Meghan.Pomeroy@ontario.ca>; Mike Latimer <m.latimer@wasagabeach.com>
Cc: Fisher, John (MECP) <John.Fisher@ontario.ca>; Dasti, Benjamin (MECP) <Benjamin.Dasti@ontario.ca>; m.latimer@wasagabeach.com
Subject: Main Street and Beach Areas 1 & 2 Class EA - MNRF input - 119067

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good morning Meghan,

All slides, display boards and comment sheets will be made available on the Town's website in the next day or so.
At this point, we do not foresee any impacts to the parkland.
We will be looking further at Beach Drive and how it should be configured/located and possibly raised to deal with water levels, wave uprush, etc.
If you have any questions, feel free to contact me.

With thanks

Michael Cullip, B.Eng. & Mgmt., M.Eng. P.Eng
Vice President Head Office Operations

Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200 | Collingwood | Ontario | L9Y 5A6
T 705-444-2565 x2020 | **C** 705-888-3289 | **E** mcullip@tathameng.com

---

From: Pomeroy, Meghan (MECP) <Meghan.Pomeroy@ontario.ca>
Sent: Thursday, January 30, 2020 11:56 AM
To: Mike Latimer <m.latimer@wasagabeach.com>; Michael Cullip <mcullip@tathameng.com>
Cc: Pomeroy, Meghan (MECP) <Meghan.Pomeroy@ontario.ca>; Fisher, John (MECP) <John.Fisher@ontario.ca>; Dasti, Benjamin (MECP) <Benjamin.Dasti@ontario.ca>
Subject: Main St. Reconstruction & Beach Area 1&2 Revitalization - MCEA

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Appendix K:
Natural Hazard Study

Final Report

NATURAL HAZARD STUDY UPDATE
for BEACH AREAS 1 & 2

Town of Wasaga Beach

prepared by

Shoreplan
Engineering Limited

June 2020

SHOREPLAN

Natural Hazard Study Update for the Beach Areas 1& 2

Prepared for

Town of Wasaga Beach

by

SHOREPLAN ENGINEERING LIMITED

VERSION	DATE	STATUS	COMMENTS
01	2020-06-01	draft	for internal review
02	2020-06-08	draft	for client review
03	2020-08-07	final draft	for client review
04	2020-09-15	final	

The front cover photograph was provided by Mike Pincivero, P.Eng., manager of engineering services for the Town of Wasaga Beach

EXECUTIVE SUMMARY

Shoreplan Engineering Limited completed a Natural Hazards Study for Wasaga Beach Areas 1 & 2 to address the feasibility of a 2011 Visioning Project. The Visioning Project was superseded by the 2017 Downtown Development Master Plan and the ongoing Main Street and Beach Areas 1 & 2 Class Environmental Assessment. High Georgian Bay water levels in 2019 caused notable changes to the beach profiles along much of Wasaga Beach. Shoreplan was retained to update the Georgian Bay shoreline portion of the 2014 Natural Hazards Study using topographic data surveyed in the fall of 2019.

Beach Area 1

It is our opinion that there should be no dynamic beach allowance applied south of Beach Drive because the paved road and lands south of the road prevent natural dynamic beach processes from occurring. An updated “no structures” flood hazard limit was calculated using DTM topography provided by NVCA which did not include the existing buildings and walls. That flood hazard limit extends beyond much of the existing development on the south side of Beach Drive. New development south of that line would be outside the flood hazard.

Provincial policy allows for the possibility of development within the flood hazard if specific conditions are met, including compliance with floodproofing and access standards. It is our opinion that new development could be allowed within the flood hazard limit, on the south side of Beach Drive, if those standards are met with designs completed by a qualified professional engineer. The floodproofing standard requires a more stringent wave uprush calculation than the flood hazard assessment. Constructing a wall on the south side of Beach Drive in order to meet the floodproofing standard on its own is not a practical solution due to the height of the wall that would be required.

Raising the elevation of Beach Drive as part of the redevelopment would simplify the floodproofing designs, but it is not a stand-alone task and would need to be done in conjunction with those designs. One possible design would be to raise the road to an elevation of 178.9m and construct a stepped revetment between the road or boardwalk and the beach. The raised road would be 1.2m higher than the existing average road elevation. Floodproofing for development on the south side of Beach Drive could be achieved by having a minimum structural opening in the order of elevation 179.5m. It might be necessary to complete a 2D physical model of the beach, stepped revetment, and raised road as part of the detailed design for such a solution.

The Downtown Development Master Plan and the ongoing Class EA include a new boardwalk on the north side of Beach Drive, which would fall within the limits of the dynamic beach. It is possible to construct a boardwalk that would not interfere with dynamic beach processes, but it must be designed for the expected wave conditions. One example would be to use steel piles and a steel support system that is strong enough to withstand the uplift forces from incident and reflected waves.

Any work completed within the area regulated by NVCA requires a permit from NVCA. That would include constructing a boardwalk or raising Beach Drive. Part of the requirement to obtain permits is showing that the proposed works will not have any adverse impacts on the dynamic beach.

Beach Area 2

Development setbacks for Beach Area 2 are related to the dynamic beach hazard limit. The existing boardwalk and beach grading practices impact natural coastal processes at this site. This precludes delineation of the dynamic beach allowance based on dune formations. Instead, we propose that a dynamic beach allowance in the order of the Provincial default of 30m be applied, measured from the lakeward side of the boardwalk. It is recommended that the area between the boardwalk and any development be maintained as vegetated dunes.

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1.0 INTRODUCTION

In 2011 the Town of Wasaga Beach completed a Visioning Project for Beach Areas 1 & 2 to develop a long term vision for the future of the main tourist beach area. The Nottawasaga Valley Conservation Authority (NVCA) determined that a Natural Hazards Study was required to address the feasibility of development on the Beach Area 1 & 2 lands. Shoreplan Engineering Limited completed that study in 2014. Hazard limits associated with both the Georgian Bay shoreline and the Nottawasaga River were delineated.

The 2011 Visioning Project was superseded by the 2017 Downtown Development Master Plan and the Town of Wasaga Beach is currently completing The Main Street and Beach Areas 1 & 2 Class Environmental Assessment. High Georgian Bay water levels in 2019 caused notable changes to the beach profiles along much of Wasaga Beach. Shoreplan was retained to update the Georgian Bay shoreline portion of the 2014 Natural Hazards Study using topographic data surveyed in the fall of 2019.

1.1 Report Format

This report is divided into 5 sections. Section 1 is this introduction. Section 2 describes the field work completed to document existing conditions within the study area. Section 3 describes the natural hazards along the Georgian Bay shoreline. Section 4 discusses elements of the 2017 Downtown Development Master Plan and the ongoing Class EA, and how the plan and EA are affected by the natural hazards. Section 5 presents the study conclusions.

Tables are included within the body of text where they are first mentioned. Figures are included at the end of each section in which they are first mentioned. Figures and tables are both numbered with the format X.Y where X represents the section number and Y is the figure or table number within that section.

1.2 Study Area

The Beach 1 & 2 study area consists of approximately 15 hectares (37 acres) of land situated between Beach Drive and the Nottawasaga River, and between Spruce Street and 6th Street North in the Town of Wasaga Beach, as shown on the key map of Figure 1.1. The study area includes both privately and publicly owned lands and includes a mix of uses including parkland, parking lots, commercial and restaurant establishments, and vacant structures. These lands represent the main tourist area of the Town of Wasaga Beach, and are a regular draw for tourists who frequent this area.

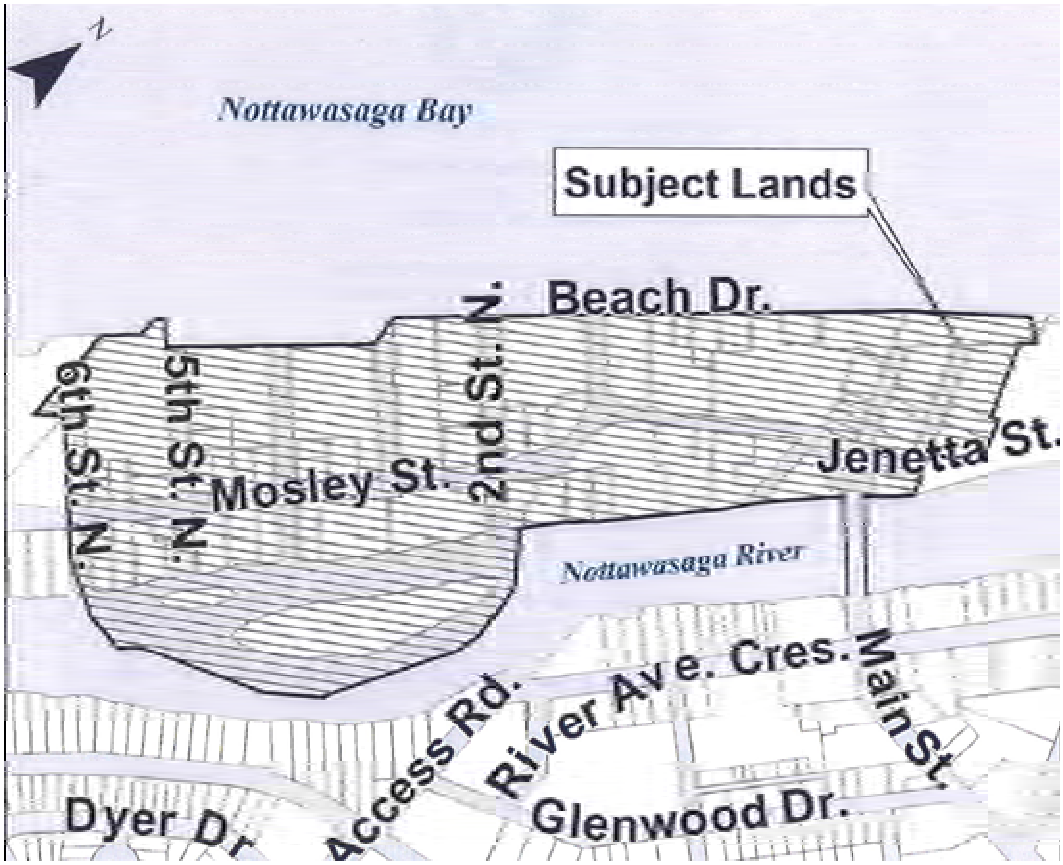
1.3 Study Goals and Objectives

The purpose of the 2014 study was to determine the feasibility of development in the study area with regard to the existing natural hazards. The specific goal of the study was to identify the location of the flood hazard areas, erosion hazard areas, and dynamic beach hazard areas and

to determine appropriate setbacks from these features to ensure that future development in the Beach 1 & 2 areas respect existing and future conditions. The study objective was to determine the appropriate setbacks from natural features existing in the Beach 1 & 2 study area through the preparation of a Natural Hazard Study and related mapping.

The objective of the study update is to recalculate the Georgian Bay flood and dynamic beach hazard limits giving regard to existing conditions in the fall of 2019, and to revise the hazard mapping if required.

Figure 1.1 Study Area Key Map



2.0 EXISTING CONDITIONS

As part of this project, Tatham Engineering Limited (Tatham) completed a topographic survey of the beach from east of Spruce Street to west of Third Street in the alongshore direction, and from Beach Drive to a depth of approximately 1.5m in the cross-shore direction. Figure 2.1 is a site plan showing contours for the area surveyed plus the locations of 15 profile lines. Figure 2.2 shows 2014 and 2019 cross-sections for those profile lines. The 2014 profiles were derived from a 3D surface generated from the site survey completed for the initial study. That survey was completed in May 2014.

It can be seen that the 2019 beach profiles are typically higher than 2014 profiles on the upper portion of the beach, but lower than the 2014 profiles for the lower part of the beach. That is opposite of what is typically found on natural beaches when there has been an increase in water level. The water level during the 2019 survey was approximately 1.0m higher than during the 2014 survey. Figure 2.3 shows daily water levels measured at the Canadian Hydrographic Service water level gauge in Collingwood Harbour, from May 2014 to December 2019, which is the interval between the two surveys.

Shoreplan staff carried out a field review to document existing conditions in November 26, 2019. For the purpose of site descriptions in this report, the shoreline is assumed to run in an east west direction, with the water to the north.

A significant storm occurred on November 1, 2019 and sand deposits that formed were taken as an indication of the extent of runup that occurred during that storm. Conditions during that storm are described in Section 2.1. It is likely that much of the increase in the upper beach elevation noted above occurred during that storm. It can also be assumed that beach grooming practices and extensive pedestrian traffic during the summer months flattens the upper portion of the beach profile.

Photo 2.1 is an easterly view of Beach Drive, taken from west of 2nd Street. It can be seen that Beach Drive was completely covered by sand during the November 2019 storm. Photo 2.2 shows sand that was washed a short distance up 1st Street. The limits of sand deposits like this were used for the assessment of the wave uprush modeling results described in Appendix A. Photo 2.3 shows that waves overtopped the low curb fronting the businesses east of 1st street, depositing sand up against the store fronts.

In Beach Area 2 vertical scarps cut into the sand underneath the boardwalk showed that notable wave energy had progressed that far up the beach. The distances from the front of the boardwalk to the scarps varied from 0.3 to 1.2m. Sand and debris deposits on top of the boardwalk, in line with the ramp, show that waves ran up the ramps, to at least the top of the boardwalk. An example of this is shown in Photo 2.4.

A significant storm also occurred on April 13, 2020 and conditions during that storm are described in Section 2.2. Photographs and videos taken during that storm were provided to us by Mike Pincivero, P.Eng., the manager of engineering services for the Town of Wasaga Beach.

Photo 2.5 shows flooding along the base of the armour stones fronting the parking lot west of Spruce Street. The water in the foreground appears to be active uprush from a wave bore. Photo 2.6 shows ponded water along the base of the curb fronting the businesses east of 1st Street. Photo 2.7 shows flooding west of 1st Street.

2.1 November 1, 2019 Storm

Waves that occurred during the November 1 storm were hindcast using measured wind data from an Environment Canada climate station on the Western Islands. Hindcasting uses measured wind data to estimate wave conditions for locations or times where measured wave data does not exist. The western Islands are small exposed islands in Southern Georgian Bay, approximately 65 km north of Wasaga Beach, and winds measured there are representative of conditions across the Bay and provide a good source for hindcasting. Winds measured during the November 1 storm had a peak sustained speed of 86 kph and came from north-northwest. Using an in-house parametric wave hindcast model, we estimated that the peak of the storm would have produced a deep-water significant wave height of 4.6m with a peak wave period of 9 seconds. That wave has a return-period in the order of once in ten years.

The Canadian Hydrographic Service's water level gauge at Collingwood harbour measured a peak water level of 177.61m IGLD1985, which corresponds to 177.57m geodetic. A water level of 177.61m IGLD has a return period approaching once every ten years, based on the design water levels estimated by MNR (1989).

2.2 April 13, 2020 Storm

The peak wind speed measured at the Western Islands during the April 13, 2020 storm was 73 kph and came from roughly west-northwest. A hindcast produced a 2.8m significant wave height with a peak wave period of 7 seconds at the peak of the storm. That corresponds to an annually occurring storm event. The Collingwood water level was 177.66m IGLD1985, which has a return period of once every 10 years.

GEORGIAN BAY

175.50
175.75
176.00
176.25
176.50
176.75
177.00
177.25
177.50
177.75
178.00
179.00
180.00
181.00

O N M L K J I H G F E D C B A

FOURTH STREET
THIRD STREET
SECOND STREET
FIRST STREET
SPRUCE STREET
JENETTA
MAI

50 0m 50 100 150

Project: 13-1999
Scale 1:2000

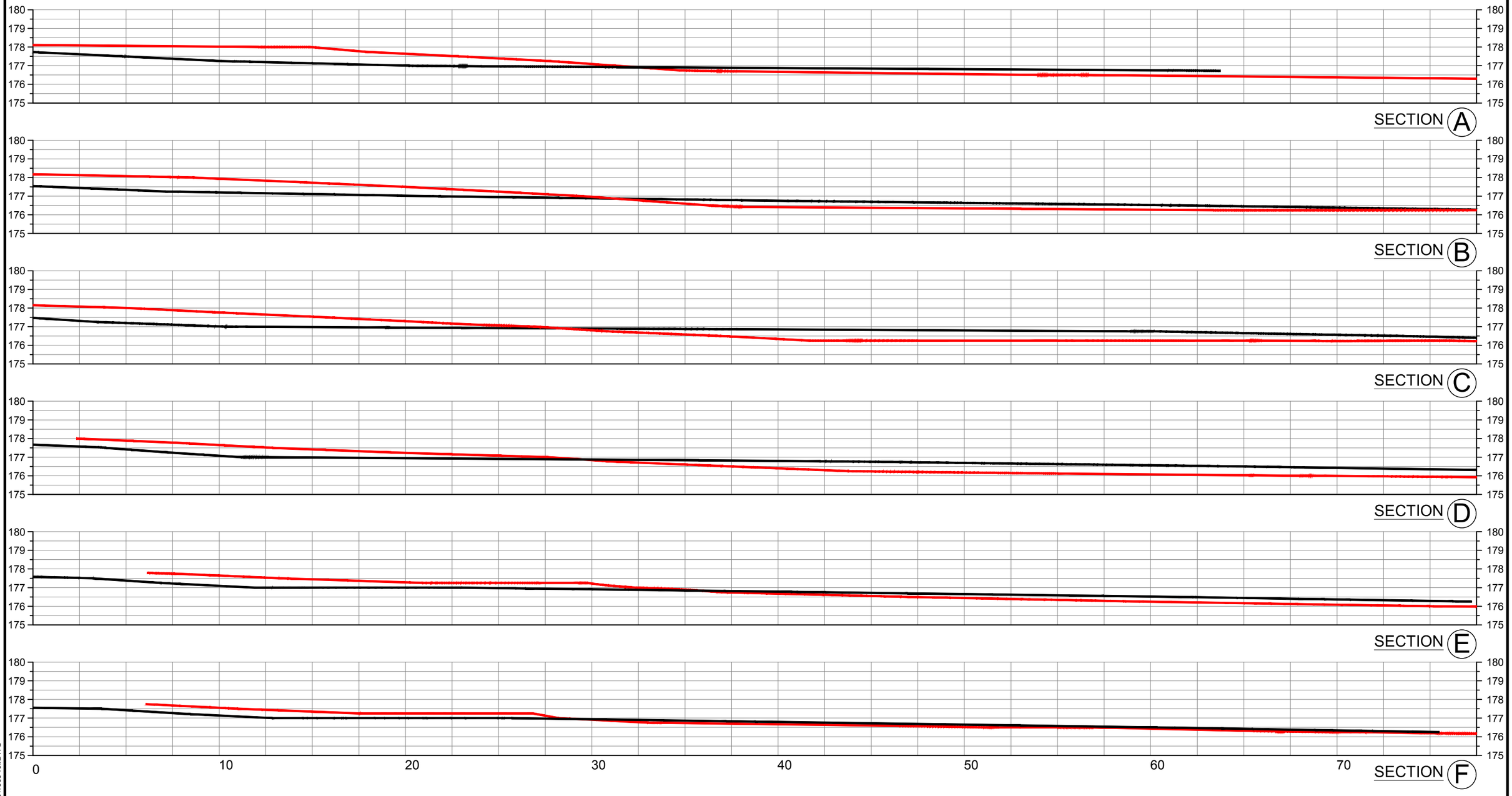
SHOREPLAN

Legend

2019 Contours

Figure 2.1
Wasaga Beach Areas 1 and 2
Site Plan

Drawing Location: S:\Shoreplan Project Files\FILES 1500 - 1999\Files 1900-1999\File 1999 Wasaga Beach Areas 1 and 2\2019 Project\Drawings\1999 r0g.dwg

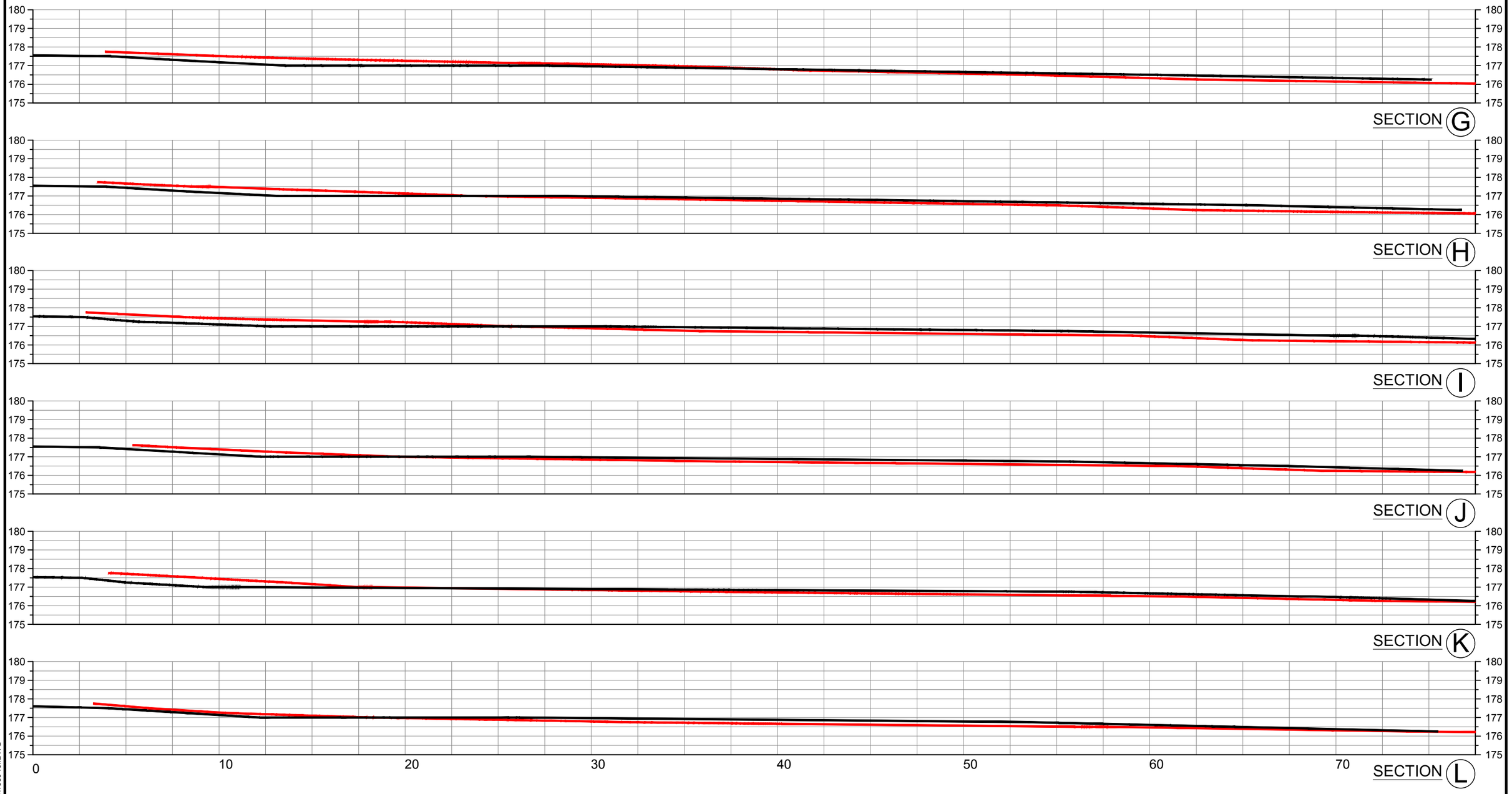


Project: 13-1999
Scale 1:200
SHOREPLAN

Legend
2019
2014

Figure 2.2a
Wasaga Beach Areas 1 and 2
Cross Sections

Drawing Location: C:\Users\cvolk\Desktop\1999 r0.DWG

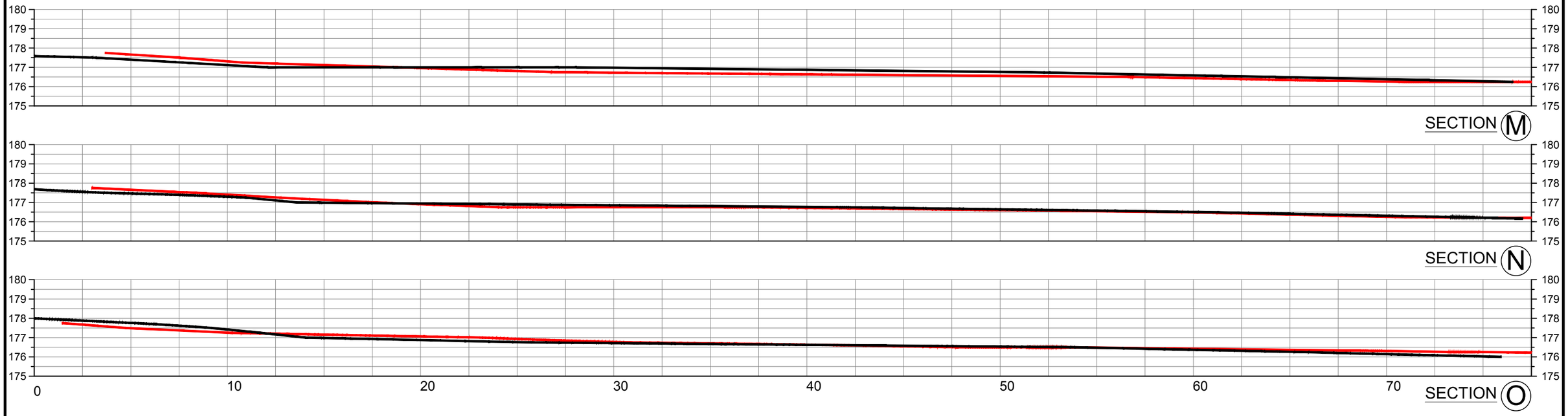


Project: 13-1999
Scale 1:200
SHOREPLAN

Legend
2019
2014

Figure 2.2b
Wasaga Beach Areas 1 and 2
Cross Sections

Drawing Location: C:\Users\cvolk\Desktop\1999 r0l.DWG



Legend

2019

2014

Project: 13-1999
Scale 1:200

SHOREPLAN

Figure 2.2c
Wasaga Beach Areas 1 and 2
Cross Sections

Drawing Location: C:\Users\cvolk\Desktop\1999 r0\.DWG

Figure 2.3 Collingwood Daily Water Levels, May 2014 to November 2019

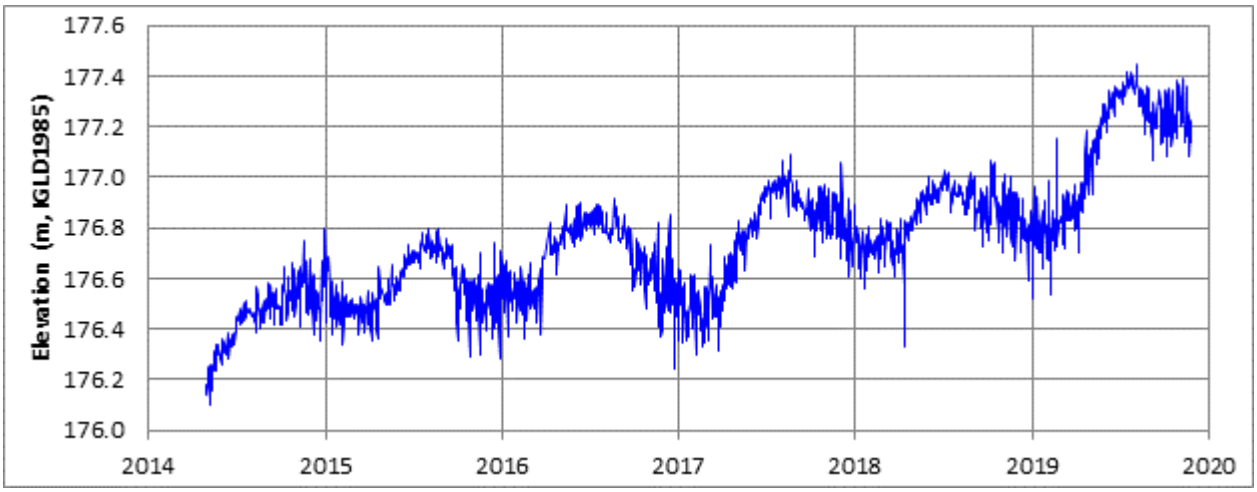


Photo 2.1 Beach Drive Covered by Sand, (November 2019)

Photo 2.2 1st Street, (November 2019)

Photo 2.3 East of First Street, (November 2019)

Photo 2.4 Sand on Boardwalk in Beach Area 2, (November 2019)

Photo 2.5 Wave Uprush West of Spruce Street , (April 2020)

Photo 2.6 Ponded Flood Water, East of 1st Street, (April 2020)

Photo 2.7 Ponded Flood Water, West of 1st Street, (April 2020)

3.0 NATURAL HAZARDS

Section 3.1 of the Provincial Policy Statement (PPS) considers three natural hazards along the shorelines of the Great Lakes; erosion hazards, flooding hazards, and dynamic beach hazards. Technical Guides prepared by MNR (2001) to support Section 3.1 of the PPS describe methods for assessing the limits of those hazards. Development within the study area on lands affected by these natural hazards is subject to approval under Ontario Regulation 172/06, which is administered by the Nottawasaga Valley Conservation Authority (NVCA).

3.1 Erosion Hazard

The erosion hazard consists of an erosion allowance plus a stable slope allowance but it is not relevant within the study area because there is no long-term recession of the beach. The erosion allowance is defined as 100 times the average annual recession rate, but with no average annual recession there is no erosion allowance.

3.2 Flooding Hazard

The flooding hazard for Great Lakes shoreline is defined as the 100-year flood level plus an allowance for wave uprush and other water related hazards. The 100-year flood level is defined as the water level having a 1% probability of occurrence in any given year. MNR (1989) calculated instantaneous water levels for all Canadian shores on the Great Lakes using a combined probability analysis of monthly mean lake levels and storm surges. Table 3.1 shows the calculated water levels for different return periods for the shoreline sector including Wasaga Beach. The 100-year flood level for Wasaga Beach is 178.0 metre.

Table 3.1 MNR (1989) Design Water Levels for Wasaga Beach

Return Period (years)	2	5	10	25	50	100
Instantaneous Water Level (metres, GSC)	177.19	177.49	177.65	177.81	177.91	178.00
Highest Annual Monthly Water Level (m GSC)	176.67	176.96	177.11	177.26	177.36	177.44
Wind Set Up, Wind Surges (metres)	0.50	0.61	0.68	0.78	0.85	0.93

MNR (2001) recommends that the wave uprush allowance be calculated for a 20-year return period storm occurring at the 100-year water level. The 20-year return period wave was calculated during the 2014 study as having a deep-water significant wave height of 5.1m with a peak wave period of 10 seconds at the 90% upper confidence interval. That wave had a significant height of 4.0m at a 25m water depth and was used in the 2014 analysis. The same wave condition was used for this updated analysis.

Wave uprush elevations were computed for representative profiles using a wave uprush program developed for composite slope profiles. The program applies different wave runup equations (depending on the backshore conditions and composition) to calculate the furthest inland extent of wave uprush. The maximum wave uprush experienced on a profile is not necessarily caused by the largest breaking waves due to the profile geometry. Smaller waves breaking on shallower, steeper portions of the profile can produce greater wave uprush than larger waves breaking further offshore with a flatter equivalent slope. The composite wave uprush program identifies the breaking wave height which causes the furthest inland excursion of wave uprush.

The 2014 study applied the Hunt uprush equations described in the appendices to MNR (2001). For this updated study we used the design and assessment approach for runup on gentle slopes as described in EurOtop (2018). In the 2014 study the composite slope uprush model used a phase averaging wave transformation model, which transferred the significant wave height across the surf zone. That significant wave height is a statistical representation of the individual waves that occur during the period modelled. For this updated study we used a phase resolving wave-flow model, which models the water surface elevation associated with each individual wave during the period considered. This method provides a more accurate description of incipient breaking and enables the broken waves to propagate with a correct gradual change of form and to resemble steady bores in a final stage.

Cross-sections for the wave uprush analysis were synthesized from the Tatham 2019 beach survey, 2016 bathymetric soundings and digital terrain model (DTM) topography provided by NVCA, and Canadian Hydrographic Service (CHS) digital field sheets. The NVCA data was provided as a composite data that extended from at least Mosley and Janetta Streets inland, to approximately the 171m contour offshore. Cross-sections generated from the NVCA data were modified over the portion of the beach covered by the Tatham survey and extended into deeper water using the CHS data.

The accuracy of the calculated wave uprush limits was assessed by modeling the uprush associated with the November 1, 2019 and April 13, 2020 storms described in Sections 2.1 and 2.2, respectively. The results of those comparisons are presented in Appendix A. The match of predicted to observed uprush limits was considered to be good.

The NVCA DTM topography represents the terrain and does not include buildings and walls, such as those on the south side of Beach Drive. The 2014 study identified those buildings and walls as defining the flood hazard limit because they restrained the inland flow of the overtopping waves. That hazard limit will not change where there are obstructions. The updated flood hazard limit, which is referred to as the no-structures flood hazard limit because it does not consider the effect of any structures, is shown on Figure 3.1. This limit is notably further inland than the no-structures hazard limit presented in the 2014 study due to the different wave module, uprush equations, and topography used.

Mapping the horizontal limit of the flood hazard where it is restrained by a solid obstruction does not provide any information about the extent of flooding that occurs at that limit. However, that information is important to those who must deal with the flooding risk.

Potential flood depths along the walls and buildings south of Beach Drive were estimated from the results of the wave transformation model used in the uprush analysis. Bore heights in the order of 0.5 to 0.6m were predicted for the walls and storefronts from 3rd Street to the group of buildings east of 1st Street. This corresponds to the area shown on Sheet 2 of Figure 3.1 Further to the east, wave heights were predicted to be in the order of 0.3 to 0.4m, but that is likely due to the higher beach elevation in this area. Considered that the beach is regularly groomed, it would be reasonable to assume a 0.6m wave height for the entire reach south of Beach Drive. When that 0.6m high wave hits a physical barrier it will splash up higher yet. How that impacts floodproofing design and development setback is discussed in Section 4.1.

3.3 Dynamic Beach Hazard

Figure 3.1 shows the dynamic beach hazard limit defined in the 2014 study. It was our opinion that there should not be a dynamic beach allowance applied to the Beach Area 1 portion of the study area due to the impacts of the existing development. That opinion was accepted by NVCA. The changes to the beach profiles north of Beach Drive associated with the recent high water levels do not change that opinion, and we still recommend that a dynamic beach allowance not be applied here.

It is important to note that not requiring a dynamic beach allowance does not mean that there will be no dynamic beach processes in Area 1. There are two key reasons for applying a dynamic beach allowance. One is that dunes on a dynamic beach shoreline act as a reservoir of sand, which is transported offshore to form breaker bars during storm conditions. Those bars limit wave heights due to breaking, which in turn minimizes erosion of the beach and dunes. A second is that lowering of the beach profile allows wave uprush to extend further inland than it would if the beach profile did not adjust. Neither of these dynamic processes occur at this site due to the presence of Beach Drive and the development to its south. However, sand can be deposited anywhere within the wave uprush limit, as has been experienced recently. That is a dynamic beach process. Wind will also blow sand inland, including well inland of where dynamic beach allowances are applied.

Two dynamic beach hazard limit lines are shown for Beach Area 2, one 30m back from the lakeward edge of the boardwalk, and one 25m back from the edge of the boardwalk. The edge of the boardwalk was a conservative estimate of where the flood hazard limit would have been if the annual beach grooming described in the 2014 report was not carried out. The 30m dynamic beach allowance corresponds to the default value recommended for use by MNR. The 25m allowance was suggested as a reasonable allowance that would accommodate the preferred vision plan from the 2011 Visioning Project that was the impetus for 2014 Natural Hazard Study. The 2017 Downtown Development Master Plan shows a resort/residential zone fronted by a

beach boardwalk that is similar in function to the preferred vision plan. There is no need to change the recommended dynamic beach hazard limits as a result of the recent high water levels because the purpose of the dynamic beach allowance is to accommodate the profile changes that occur during high water levels.

3.4 Nottawasaga River Hazards

Updating the Nottawasaga River hazards was not part of this study.

3.5 NVCA Regulation Limits

NVCA guards against the risks associated with natural hazards by regulating development within the watershed. This is accomplished through the application of Ontario Regulation 172/06. The limit of the regulated area is defined by first estimating the limit of the natural hazards using scientific studies, then adding an additional 15 metre allowance. The purpose of the additional 15 metre allowance is to ensure that all potentially hazardous lands are considered during the development review process. It is important to note that the limits of the regulated area are not intended to define the limits of the natural hazards.

Figure 3.1 shows the limits of the NVCA regulated area associated with Georgian Bay's natural hazards, as defined during the 2014 study. This study has revised the no-structures wave uprush limit, so the NVCA regulated limit line could be moved further landward, but as the new uprush limit is within the existing regulated area, we do not see a need to do that.

Any work completed within the regulated area requires a permit from NVCA. That would include constructing a boardwalk, as discussed in Section 4.1.2, or raising Beach Drive, as discussed in Section 4.1.1. Part of the requirement to obtain permits is showing that the proposed works will not have any adverse impacts on the dynamic beach.

GEORGIAN BAY

25m DYNAMIC BEACH ALLOWANCE

30m DYNAMIC BEACH ALLOWANCE

176.00

177.00

178.0

100 YEAR FLOOD LINE

NO STRUCTURES FLOOD HAZARD LIMIT

see SHEET 2

see SHEET 3

see SHEET 4

BEACH DRIVE

THIRD STREET

SECOND STREET

FIRST STREET

MOSLEY STREET

MAIN STREET

SPRUCE STREET

JENETTA STREET

WILLOW STREET

SIXTH STREET

FIFTH STREET

FOURTH STREET

RIVER ROAD EAST

RIVER AVENUE CRESCENT

PROJECT NORTH

Beach Study Area 1

Beach Study Area 2

Scale 1:3000

SHOREPLAN

Figure 3.1, Sheet 1
Wasaga Beach, Ontario
Site Plan

GEORGIAN
BAY

PROJECT
NORTH

176.00

177.00

178.0

100-YEAR FLOOD LEVEL

NO STRUCTURES
FLOOD HAZARD LIIMIT

25m DYNAMIC BEACH
ALLOWANCE

30m DYNAMIC BEACH
ALLOWANCE

LIMIT OF NVCA
REGULATED AREA

LIMIT OF STUDY AREA

SIXTH STREET

FIFTH STREET

FOURTH STREET

Scale 1:1000
SHOREPLAN

Figure 3.1, Sheet 2
Wasaga Beach, Ontario
Site Plan

GEORGIAN BAY

176.00

177.00

178.0

PROJECT NORTH

BEACH DRIVE

THIRD STREET

SECOND STREET

FIRST STREET

MOSLEY STREET

DYNAMIC BEACH ALLOWANCE

LIMIT OF NVCA REGULATED AREA

100-YEAR FLOOD LEVEL

NO STRUCTURES FLOOD HAZARD LIIMIT

Scale 1:1000

SHOREPLAN

Figure 3.1, Sheet 3
Wasaga Beach, Ontario
Site Plan

GEORGIAN BAY

176.00

177.00

178.0

PROJECT NORTH

100-YEAR FLOOD LEVEL

NO STRUCTURES
FLOOD HAZARD LIMIT

BEACH DRIVE

LIMIT OF NVCA
REGULATED AREA

MAIN STREET

SPRUCE STREET

LIMIT OF STUDY AREA

Scale 1:1000

SHOREPLAN

Figure 3.1, Sheet 4
Wasaga Beach, Ontario
Site Plan

4.0 DDMP and Class EA

Figure 4.1 shows the Downtown Development Master Plan (DDMP) recommendation for the Beach District (Forrec Limited, 2017). Figure 4.2 shows the preferred option for Beach Drive developed during the Main Street and Beach Areas 1 & 2 Class Environmental Assessment (Tatham, 2020). This section of the report discusses how the natural hazards affect different aspects of the DDMP and Class EA. While the no-structures flood hazard limit has been shifted inland with this update, the 2014 recommendations related to potential development within the regulated areas have not changed significantly.

Development within the study area is subject to minimum setbacks related to the natural hazard limits. Development setbacks for the Beach Area 1 portion of the study area are related to the flood hazard limit. Development setbacks for Beach Area 2 are related to the dynamic beach hazard limit. Each of these areas is discussed separately below.

4.1 Beach Area 1

The site plan in Figure 3.1 (sheets 3 and 4) shows that the existing development along the south side of Beach Drive is mostly located within the flood hazard limit. Some of the proposed new development for this area, shown in the DDMP (Figure 4.1) and Class EA (Figure 4.2), is in line with the existing development and therefore also within the limit of the flood hazard. It is provincial policy, as stated in the PPS and NVCA planning guideline, that future development shall generally be directed to areas outside of natural hazards. However, with respect to flooding and erosion hazards, provincial policy does allow for the possibility of development within those portions of hazardous lands where:

"….the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards, and where all of the following are demonstrated and achieved:

a) development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards;

b) vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion, and other emergencies;

c) new hazards are not created and existing hazards are not aggravated; and

d) no adverse environmental impacts will result." (2014 PPS).

Similarly, Ontario Regulation 172/06, which is enforced by NVCA, states that the Authority may grant permission for development within the limits of the natural hazards "if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development". It is our opinion that development can be safely allowed within the flood hazard limit for Beach Area 1, as defined in this study if suitable floodproofing measures are applied.

The floodproofing standard does not in itself describe how floodproofing should be carried out but it does define the design water level that must be used while implementing the floodproofing. The floodproofing standard is based on the limit of wave uprush calculated under more extreme conditions than those used for the flood hazard limit calculation. MNR (2001) defines the floodproofing standard as the 100-year monthly lake level plus the 100-year storm surge plus an allowance for wave uprush from a 50 to 100-year return period wave condition. The sum of the 100-year monthly lake level (177.44m, Table 3.1) and the 100-year surge level (0.93m) is 178.37m GSC; which is 0.37m higher than the 100-year flood level calculated from a combined probability analysis.

Floodproofing may be defined as structural changes and/or adjustments incorporated into the basic design and/or the construction or alteration of individual buildings, structures or properties to protect them from flood damage. MNR (2001) defines two general types of floodproofing as follows:

". dry floodproofing

. the use of fill, columns, or design modifications to elevate openings in buildings or structures above the regulatory flood level, or

. the use of water tight doors, seals, berms/floodwalls to prevent water from entering openings below the regulatory flood level.

. wet floodproofing

. the use of materials, methods and design measures to maintain structural integrity and minimize water damage

. buildings or structures designed to intentionally allow flood waters to enter.

There are two basic techniques to floodproofing, defined as:

. active floodproofing

. floodproofing techniques which require some action prior to any impending flood in order to make the flood protection operational, i.e. closing of water tight doors, installation of waterproof protective coverings over windows, etc.

. passive floodproofing

. floodproofing techniques which are permanently in place and do not require advance warning and action in order to make the flood protection effective."

MNR (2001) states that in general, dry, passive flood protection is the most desirable approach for all types of development. For this site, constructing above the floodproofing elevation is the preferred means of achieving this and should be implemented to the fullest possible extent.

Floodproofing design is project specific as the floodproofing elevation can vary depending upon the wave uprush characteristics of the actual development. A proper floodproofing design for

any new development should be carried out by a qualified professional engineer. Part of the floodproofing design will be to ensure safe egress exists during flooding events.

The wave uprush calculations described in Section 3.2 were repeated for a few selected profiles using the floodproofing standard instantaneous water level of 178.37m and predicted wave bore heights along the front of the existing buildings varied between approximately 0.7 and 0.8m. Floodproofing for that wave height is possible but could be challenging given the existing ground elevations.

Constructing a wall on the south side of Beach Drive in order to meet the floodproofing standard on its own is not a practical solution. A 0.8m high wave hitting a vertical wall under the floodproofing design condition will produce impulsive overtopping, which is a sudden and violent uprushing jet of water. EuroOtop (2018) notes that with impulsive conditions, water is thrown high into the air, which means that overtopping occurs even for very high structures. The vertical distance that the overtopping wave travels is more or less independent of the actual height of the structure. At a concept level analysis, a wall designed to prevent overtopping would need to have a top elevation in the order of 181.6m, which is almost 4m higher than the average centreline elevation of Beach Drive.

4.1.1 Raising Beach Drive

Because the whole beach area will be redeveloped, the possibility of raising the elevation of Beach Drive has been considered. However, selecting a design elevation for Beach Drive is not a stand-alone task. The new road elevation must be determined in conjunction with the floodproofing design for development on the south side of the road. Only raising the road to prevent flooding is not practical due to the height to which it would have to be raised. It is also important to note that, following provincial guidelines, it is not possible to raise the road to "remove it from the flood hazard". The flood hazard limit is delineated for existing conditions, and once defined its location does not change. Steps may be taken to address the flooding hazard, but the actual hazard limit remains in place. Those steps must consider the floodproofing design conditions. Depending on the form of barrier between the raised road and the beach, the road would need to be raised in the order of 3m to keep the wave uprush below the flood elevation, under floodproofing design conditions. That is neither practical nor reasonable.

A more practical solution would be to raise the road to a lesser extent and floodproof development of the south side of the road. The existing elevation along the centreline of Beach Drive varies between177.69m and 177.86m, with an average elevation of 177.74m (based on the NVCA DTM data). Water depths on the road, assuming the average elevation, would be 0.26m and 0.63m, respectively, for the 100-year design and floodproofing design elevations described above. That is before wave uprush is taken into account.

One possible design would be to raise the road to an elevation of 178.9m and construct a stepped revetment between the road or boardwalk and the beach. The raised road would be

1.2m higher than the existing average road elevation, 0.9m above the 100-year flood elevation, and 0.53m above the floodproofing design water level. Calculations using equations from the EurOtop (2018) Overtopping Manual, and a number of approximations show a mean overtopping rate of 3 to 4 l/s/m for the 100-year design wave and water level conditions. That is a relatively small overtopping rate that would not be expected to cause any significant issues to either people or property. The mean overtopping rate during the floodproofing design conditions would be in the order of 65 l/s/m. That rate is manageable in terms of floodproofing structures on the south side of Beach Drive, which could be achieved by having a minimum structural opening in the order of 0.6m above the road elevation. That would produce a minimum structural opening elevation of approximately 179.5m.

While that mean overtopping rate would be manageable in terms of floodproofing structures, it would not be considered safe for pedestrian traffic on the road. However, the potential risk to pedestrian traffic would be considerably less than exists now, so it is our opinion that the overtopping risk associated with a raised road would not be sufficient grounds to deny approvals under NVCA regulations.

It must be stressed that the numbers presented above are only approximate due to the complexity of wave overtopping on stepped revetments. An increase in surface roughness reduces the wave runup, and the surface roughness is dependent on the step geometry in proportion to the hydraulic boundary condition (Kerpen and Schlurmann, 2016). The very flat slope of the graded beach presents a hydraulic boundary condition that is not widely represented in the data sets used to develop the overtopping equations. It might be necessary to complete a 2D physical model of the beach, steps, and raised road as part of the detailed design for such a solution.

With the use of proper floodproofing techniques it would be appropriate to allow new development in line with the existing development within the Beach Area 1 portion of the study area. That development is located within the flood hazard limits shown in Figure 3.1, but it is within the least hazardous portion. Minimum development setbacks for Beach Area 1 would then be based on municipal planning regulations, not the natural hazard limits.

4.1.2 Main Beach Continuous Boardwalk

Currently a boardwalk exists east and west of the main beach area (which has no boardwalk). The Downtown Development Master Plan shows a beachfront boardwalk across all of Beach Areas 1 & 2, and the Class EA preferred alternative shows it as a 3m wide boardwalk adjacent to the beach. It location relative to Beach Drive as it currently exists is not shown precisely, but it can be presumed to extend approximately 3m into the existing dynamic beach. It is our opinion that the dynamic beach processes have been so altered within this area that adding such a boardwalk would not cause a significant additional impact. While development within a dynamic beach is not typically encouraged, we believe it would be acceptable under these circumstances.

Under existing conditions there are no dunes to supply sand to offshore bars during storm events at high water levels. A severe storm at design water levels can be expected to alter the existing profile to the extent that beach maintenance will be required after the storm. Increasing the width of the hardened shore by 3 metres will not have a significant impact on the required maintenance. A pile-supported boardwalk similar to those it would connect to will have a negligible impact on the sediment transport conditions that would occur if the boardwalk is not present. The boardwalk would have to be designed to deal with wave impact and the possible reflection of waves off the roadway. One option would be to use steel piles and a steel support system that is strong enough to withstand the uplift forces from incident and reflected waves. The effects of sand abrasion would need to be considered in the steel design.

It has been suggested that if a boardwalk is constructed it could include elements designed to reduce the flooding hazard south of Beach Drive. While this is true, it must be realized that flood mitigation would be achieved by constructing a physical barrier with a noticeable height above the existing beach and road grades. This in turn could have a notable impact on the beach processes due to wave reflection. It would also require a deeper and more substantial foundation that would increase the construction cost significantly. This sort of flood mitigation alone is not feasible to facilitate new development on Beach Drive, although it could be a component of the floodproofing design. Including a boardwalk as part of a raised Beach Drive, which is discussed in Section 4.1.1, would not necessarily raise any new issues beyond those associated with the design of the protection for the roadway.

In order to construct a boardwalk, a permit will be required from NVCA under Ontario Regulation 172/06. That will require NVCA agreeing that, under these specific circumstances, it is appropriate to construct within the limit of the dynamic beach. If the beach is owned by the Town then no other non-Municipal permits should be required. If the beach is considered to be Crown land then an MNR Work Permit may be required under the Public Lands Act. The Public Lands Act requires a permit to construct a trail on public lands, but there are some exceptions, including provincial parks and conservation reserves.

4.2 Beach Area 2

The development setback for the Beach Area 2 portion of the study area is dictated by the dynamic beach allowance, and hence the dynamic beach hazard limit. In Section 3.3 we suggested the dynamic beach allowance be in the order of 30 metres from the lakeward edge of the existing boardwalk. The existing boardwalk and, to a greater extent, the existing beach grading practices already impact the dynamic beach processes in this area. The proposed dynamic beach allowance is shown in the site plan (Figure 3.1, sheets 1-3).

The current practice of beach maintenance is expected to continue, including rather extensive annual re-grading. There is merit to considering placing some of that excavated sand on the landward side of the boardwalk to assist dune formation within the dynamic beach allowance. This matter should be discussed with both NVCA and Wasaga Beach Provincial Park staff.

The 2014 Natural Hazards Study discussed proposed plans for new structures set back approximately 25 metres from the boardwalk, with a "New Beachfront Pedestrian Promenade" between the structures and the boardwalk. Given that dynamic beach processes are already altered here, it was our opinion that a 25m wide dynamic beach allowance could be accepted. The DDMP (Figure 4.1) shows privately owned accommodations landward of the proposed boardwalk. It is our recommendation that any such structures be kept at least 25m back from the boardwalk and that the area between the boardwalk and the structures be maintained as vegetated dunes. Staircases could be built over the dune to provide access to the boardwalk. The location of a 25m wide dynamic beach allowance is also shown in Figure 3.1.

4.3 Developable Lands

Based on the above discussion, Figure 4.3 shows the developable lands within the study area, with respect to the natural hazard limits. On the south side of Beach Drive there are developable lands within the flood hazard limit as well as on lands outside the hazard limits. West of Third Street the development setback is based on a 25 metre dynamic beach allowance, as discussed in Section 4.2.

Development limits along the southern edge of the study area are based on the Nottawasaga River floodplain limit defined by NVCA, as described in the 2014 study report, and have not changed as part of this update.

4.4 Additional Studies

NVCA's planning and regulation guidelines define the flood hazard limit as the 100-year flood elevation plus an allowance for wave uprush and other water related hazards. The MNR (2001) Technical Guides define the floodproofing standard as the 100-year mean lake level plus the 100-year wind setup (storm surge) plus an allowance for wave uprush and other water related hazards. In both cases the 100-year water levels have, in practice, been based on values determined by MNR (1989).

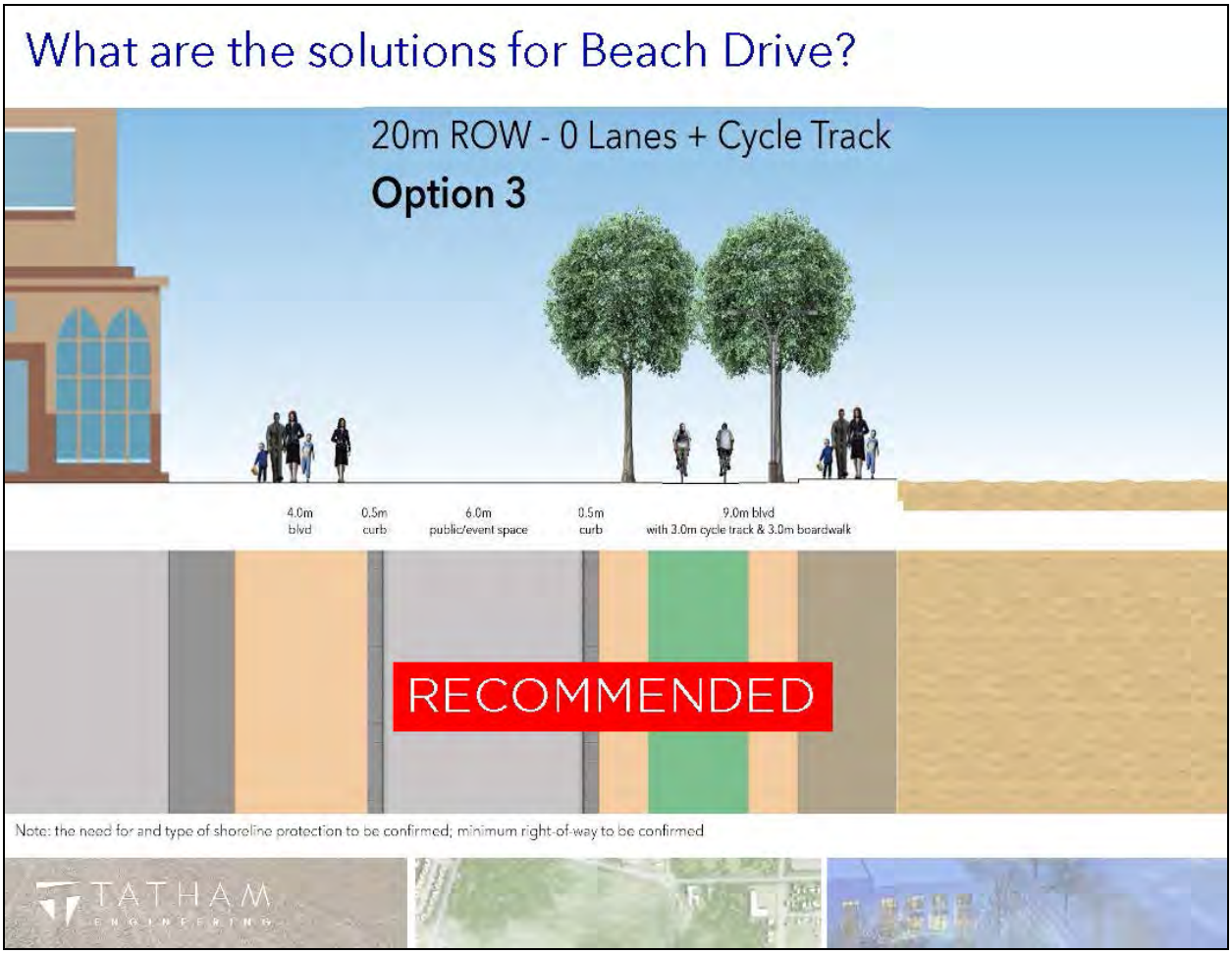
There are now 32 more years of water level data available for analysis, including data from 2020 when record high monthly mean water levels were established. Some conservation authorities have begun the process of reviewing the water levels used in the policies and guidelines. There is merit to updating the design water level used at Wasaga Beach, whether that update is completed by NVCA or as part of a major project such as the downtown redevelopment.

If Beach Drive is raised, a detailed design will be required for the wave and flood protection for the roadway. Carrying out a physical model study as part of that design will be the most accurate method of determining the wave overtopping that occurs during a design event. That overtopping information will be key to an efficient floodproofing design for new development south of Beach Drive.

Figure 4.1 Downtown Development Master Plan – Beach District

from Forrec Limited (2017)

Figure 4.2 Class EA Preferred Option for Beach Drive



from Tatham (2020)

GEORGIAN BAY

176.00

176.00

176.00

177.00

177.00

177.00

TATHAM 100 YEAR FLOOD LINE

178.0

178.0

BEACH DRIVE

THIRD STREET

SECOND STREET

FIRST STREET

MOSLEY STREET

STREET

MAIN STREET

SPRUCE STREET

JENETTA STREET

WILLOW STREET

SIXTH STREET

FIFTH STREET

FOURTH STREET

MOSLEY STREET

MAIN STREET

RIVER ROAD EAST

RIVER AVENUE CRESCENT

PROJECT NORTH

Developable Lands Outside the Natural Hazard Limits

Developable Lands Within the Flood Hazard

Scale 1:3000

SHOREPLAN

Figure 4.3
Wasaga Beach, Ontario
Development Setbacks for Natural Hazards

5.0 Conclusions

1) There is no erosion hazard along the Nottawasaga Bay shoreline of Beach Areas 1 & 2.

2) The beach on the north side of Beach Drive meets the MNR definition of a dynamic Beach. There should be no dynamic beach allowance applied south of Beach Drive due to existing development. The paved road and lands south of the road prevent natural dynamic beach processes from occurring.

3) A boardwalk constructed on the north side of Beach Drive would be within the limits of the dynamic beach, but it would not significantly alter beach processes beyond the extent to which they have already been altered. A boardwalk in this area is feasible if properly designed for the wave conditions.

4) An updated “no structures” flood hazard limit was calculated for the developed portion of Beach Area 1. The calculation used DTM topography supplied by NVCA that does not include the existing buildings and walls. While new development should generally be directed to areas outside of natural hazards, development could be allowed on the south side of Beach Drive if the floodproofing standard and access standard are met. The minimum development setbacks for Beach Area 1 would then be dictated by municipal bylaws rather than the natural hazard limit.

5) Constructing a wall on the south side of Beach Drive in order to meet the floodproofing standard on its own is not a practical solution due to the height of the wall that would be required. Likewise, raising the elevation of Beach Drive alone in order to meet the floodproofing standard is not practical. However, raising Beach Drive would simplify the floodproofing designs for structures on the south side of the road. Design of the new road elevation would need to be done in conjunction with the floodproofing design of the structures south of the road. Using a physical model for the design of the protection structure for the raised road will be the most accurate method of determining the wave overtopping that occurs during a design event. That overtopping information will be key to an efficient floodproofing design for new development south of Beach Drive.

6) Development setbacks for Beach Area 2 are related to the dynamic beach hazard limit. We propose that a dynamic beach allowance in the order of 30m be applied, measured from the lakeward side of the boardwalk. It is recommended that the area between the boardwalk and any development be maintained as vegetated dunes.

7) There is merit to updating the 100-year design water level and floodproofing design water level used at Wasaga Beach.

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Appendix A Assessment of Wave Uprush Modelling

Wave uprush limits were computed from two storms where observations gave some indication of uprush conditions during the storms. The storm events were hindcast using wind data measured at the Western Island and water levels measured at Collingwood. The first storm was on October 31 and November 1, 2019, with the storm peak occurring in the early hours of November 1. The second storm was on April 13 and 14, 2020 with near peak wave heights occurring from early evening on the 13th to late morning on the 14th. Table A1 summarises conditions from the peak of the storms.

Table A1 Conditions at the Storm Peak

Item	November 1, 2019 Storm	April 13, 2020 Storm
Wind Speed (kph)	86	73
Wind Direction	North-Northwest	West-Northwest
Deep Water Significant Wave Height (m)	4.6	2.8
Peak Wave Period (s)	9	7
Deep Water Wave Direction	Northwest	Northwest
Approximate Return Period (years)	10	1
Peak Water Level (m, geodetic)	177.57	177.62

Wave uprush limits were calculated on four profiles for the two storm events. Figure A1 shows the location of those profiles, which are identified by their chainage along the baseline used in the 2014 Beach One and Two Natural Hazards Study. Figures A2 to A5 show the calculated wave uprush limits on the different profiles, along with corresponding photographs from our November 26, 2019 site review. Sand and debris deposits observed during the site review were assumed to represent the wave uprush limit from the November 1 storm. The edges of the sand deposits were estimated by pacing off distances.

Profile 0+270, shown in Figure A2, is approximately 160m east of 1st Street, on the parking lot between the Burger King restaurant and South Beach bar and grill. The edge of the sand deposit adjacent to the Burger King was approximately 1 to 2m past the edge of the building. The predicted uprush elevation is roughly in line with the edge of the building, which is a good match.

Profile 0+435, shown in Figure A3, is on 1st Street. The wave uprush limited was calculated to be approximately 1.5m south of the line of the front of the buildings east of 1st Street. The distance to the edge of the sand was not measured at this location, but based on photographs it appears to be 1 to 2m past the building.

Profile 0+532, shown in Figure A4, is on 2nd Street. The edge of the sand was estimated to be 1 to 2m past the row of the telephone poles. The calculated wave uprush solution was 2m past that row.

Profile 0+634, shown in Figure A5, is on 3rd Street. The edge of the sand was estimated to be 5m south of the corner of the wall to the east. The uprush limit was calculated to be 3m south of that corner. This is considered to be a reasonably good match.

Section 3.2 describes modeled wave bore heights along the walls and storefronts from 3rd Street to the group of buildings east of 1st Street, for the design conditions. The predicted wave heights on that alignment for the four profiles shown on Figure A1 were 15cm for all profiles, during both storms. We do not have wave height measurements during either storm, but video taken by town staff prior to the peak of the April 13, 2020 storm shows bores in the order of 1 to 2cm in height reaching part way across Beach Drive. Photographs show ponded water in the order of 5cm deep. These suggest that wave heights in the order of 15cm during the peak of the storm are possible.

Figure A1 Wave Uprush Profiles

Figure A2 Profile 0+270

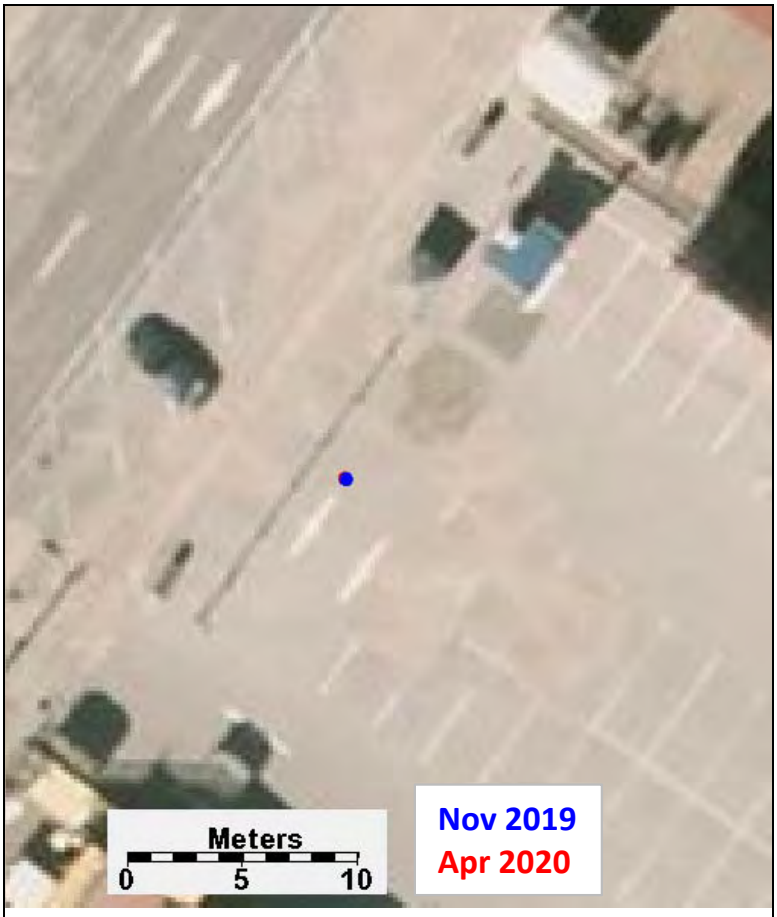


Figure A3 Profile 0+435

Figure A4 Profile 0+532

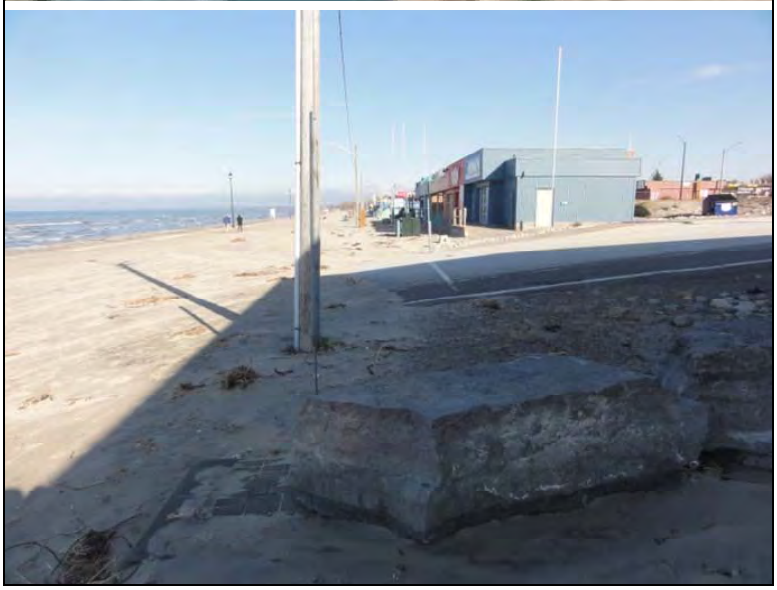
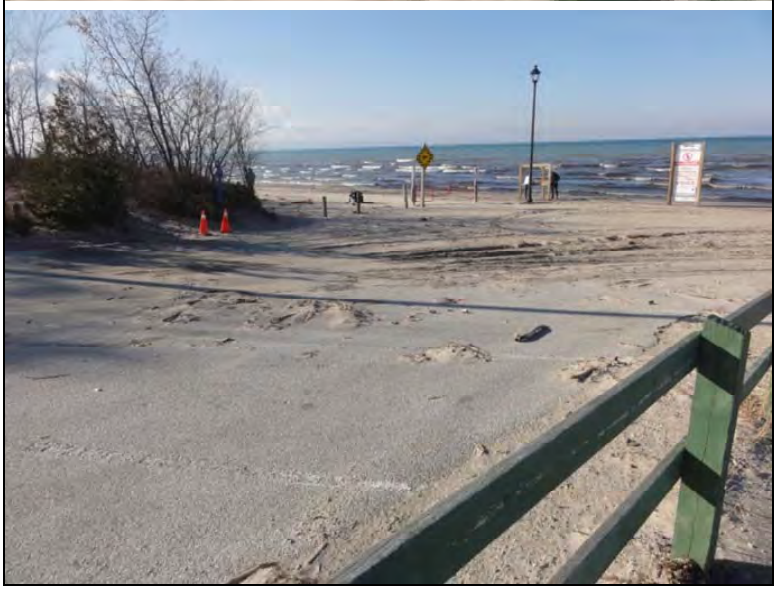


Figure A5 Profile 0+634



Appendix L:
Traffic Noise Impact Study

DRAFT

TRAFFIC NOISE IMPACT STUDY

Proposed Road Improvements
Municipal Class Environmental Assessment

"Main and Mosley Streets"

River Road West to 6th Street North
Wasaga Beach
County of Simcoe

Prepared for:

Tatham Engineering Limited

Prepared by:

Ralph Bouwmeester, P. Eng.

December 18, 2020

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RBA File: A19024

EXECUTIVE SUMMARY

R. BOUWMEESTER & ASSOCIATES has been retained by Tatham Engineering Limited to assess the impact of future traffic noise on lands adjacent to proposed reconstructed sections of Main and Mosley Streets in the Town of Wasaga Beach.

The purpose of this study is to assess increased traffic noise resulting from future traffic due to the proposed road improvements. The improvements form part of the Town's vision to redevelop the area as set out in the Wasaga Beach Downtown Development Master Plan.

The improvements are subject to a Municipal Class Environmental Assessment (EA).

The goals and objectives of this study are five-fold, namely:

1. Establish noise criteria.
2. Identify noise sources and existing noise-sensitive areas (NSAs).
3. Estimate the impact of increasing traffic noise levels at existing noise-sensitive areas due to the proposed road improvements.
4. Determine the need for mitigation to protect existing noise-sensitive receptors.
5. Recommend mitigation measures if, and where, required.

This assessment has been carried out per noise criteria derived from MECP and MTO policies as described in this report. Traffic volumes have been projected to Year 2041.

This EA traffic noise study is unique in that it differs from the typical in two main areas, namely:

1) existing NSAs will be eliminated due to the redevelopment of the area, and
2) the increase in traffic is due solely to the redevelopment, not the road improvements.

In other words, and by MTO definition, without redevelopment there will be no impact because there will be no increase in traffic and traffic noise other than that due to normal growth.

Notwithstanding the above, to guide and assist the future redevelopment of the area, this study determines both the <u>increases</u> in noise levels and the <u>resultant</u> noise levels along the study route due to the predicted increase in traffic. Ultimately though, future developments will have to comply with MECP Publication NPC-300.

This study had identified seven NSAs along the study route - three along Main Street and four along Mosley Street. In each of these cases, either the warrants for mitigation are not met or the NSA will be eliminated once the area redevelops. As a result, noise mitigation is not required.

In summary, Alternatives 1, 2 and 3 are all acoustically acceptable and noise mitigation measures are not required for any of them.

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(continued)

FIGURES

APPENDICES

1. INTRODUCTION

R. BOUWMEESTER & ASSOCIATES has been retained by Tatham Engineering Limited ("Tatham") to assess the impact of future traffic noise on lands adjacent to proposed reconstructed sections of Main and Mosley Streets in the Town of Wasaga Beach. The Study Area includes Main Street from River Road West to Mosley Street as well as Mosley Street from Main Street to 6th Street North and Beach Drive. The project is subject to a Municipal Class Environmental Assessment (EA) and the Study Area includes the lands adjacent to the subject roads. See Figures and Appendices for maps.

The Study Area is approximately 2.0 km in length.

The purpose of this study is to assess increased traffic noise resulting from future traffic due to the proposed road improvements. The improvements form part of the Town's vision to redevelop the area as set out in the Wasaga Beach Downtown Development Master Plan (Final Report, March 2017) ("DDMP"). The DDMP contemplates that Beach Drive will be closed to vehicular traffic during high seasons; therefore, it is excluded from this analysis and is not discussed further.

It is noted that there are no provincial noise criteria that apply to the (re)construction of municipal roads. This is unlike the (re)construction of provincial highways and freeways, and it is unlike new residential development along existing or planned future roads. To provide an acoustic assessment of the improvements, this review is based on the MTO Environmental Guide for Noise (Oct 2006 – v1.1 rev July 2008).

2. GOALS AND OBJECTIVES

The goals and objectives of this study are five-fold, namely:

1. Establish noise criteria.
2. Identify noise sources and existing noise-sensitive areas (NSAs).
3. Estimate the impact of increasing traffic noise levels at existing noise-sensitive areas due to the proposed road improvements.
4. Determine the need for mitigation to protect existing noise-sensitive receptors.
5. Recommend mitigation measures if, and where, required.

3. GUIDELINES AND CRITERIA

As noted above, there are no specific noise criteria that apply in the case of a municipal road (re)construction project adjacent to existing noise-sensitive land uses. The Ministry of the Environment, Conservation and Parks (MECP) noise guideline (Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning Publication NPC-300) relates to the assessment of traffic noise in new developments and new sources of stationary noise (e.g. commercial/industrial operations) that may impact existing (or zoned) noise-sensitive land uses. Neither applies in this case.

The MECP and the Ontario Ministry of Transportation (MTO) developed a protocol (A Protocol for Dealing With Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments, February 1986) for assessing and dealing with the impact of noise from new or improved provincial highways and freeways on existing noise-sensitive land uses. This protocol does not apply in this case since it does not apply to municipal road projects. It is noted that the protocol requires noise controls only if the predicted noise level, due to the proposed road improvements and based on ten-year traffic projections, increases by more than 5 dBA.

The MTO issued Ministry Directive A-1 (Noise Policy and Acoustic Standards for Provincial Highways, July 1978) which was revised in August 1987 to reflect the requirements of the 1986 MECP/MTO protocol. This directive documents the MTO policy for investigating and controlling provincial highway noise and its effect on adjacent residential areas. It also establishes warrants for noise control measures.

In October 2006, the MTO issued an updated policy entitled, Environmental Guide for Noise, as part of its Environmental Standards and Practices series. Referred to simply as the *Noise Guide*, it updates, improves, and supersedes the MTO/MECP Noise Protocol and MTO Noise Policy referred to above.

According to the Noise Guide, the mitigation effort required is a function of not only the noise level increase but also the projected noise level.

TABLE 1 - Mitigation Effort Required for the Projected Noise Level with the Proposed Improvements above the Ambient [1]

Change in Noise Level Above Ambient / Projected Noise Levels with Proposed Improvements	Mitigation Effort Required
< 5 dBA change + < 65 dBA	None
≥ 5 dBA change OR ≥ 65 dBA	• Investigate noise control measures on right-of-way • Introduce noise control measures within right-of-way and mitigate to ambient if technically, economically and administratively feasible • Noise control measures, where introduced, should achieve a minimum of 5 dBA attenuation, over first row receivers

[1] Environmental Guide for Noise, MTO October 2006

Mitigation must attempt to achieve levels as close to, or lower than, the objective level (i.e. future predicted ambient without the proposed improvements) as is technically, economically, and administratively feasible.

The technical, economic, and administrative feasibility of providing mitigation is required by the Noise Guide to be reviewed as follows[2]:

Technical Feasibility	Review the constructability of the noise mitigation (i.e. design of wall, roadside safety, shadow effect, topography, achieve a 5 dBA reduction, ability to provide a continuous barrier, etc.).
Economic Feasibility	Carry out a cost/benefit assessment of the noise mitigation (i.e., determine cost per benefited receiver).
Administrative Feasibility	Determine the ability to locate the noise mitigation on lands within public ownership (i.e., provincial or municipal right-of-way).

The main differences between the new Noise Guide and the earlier policies are:

- in addition to the test for a "5 dBA increase", an upper noise level limit of 65 dBA has been set at which point noise control measures must be investigated within the right-of-way. The previous policies had no upper limit.
- in addition to evaluating sound levels in outdoor living areas ("OLA") associated with noise-sensitive areas ("NSA"), a new concept has been introduced which evaluates noise impacts along the "most exposed side" (i.e. closest side) of existing dwellings.

Noise assessments for road improvement projects typically focus on properties zoned to permit residential uses and used as principal residences. This ensures that mitigation efforts and funds are directed to areas of greatest need (i.e. principal residences). Notwithstanding the above, existing residential uses within other zones are also considered. Non-residential uses are not addressed in this analysis.

In the absence of specific guidelines governing the noise impacts of municipal road improvement projects, this study is based on the requirements of the MTO Noise Guide which includes general provisions, and provisions related to construction noise as summarized later. Although these relate to provincial highway projects, they are used in this analysis as a guide in assessing the potential noise impacts from this project.

It is important to note that this project does not fit within the typical mold for EA traffic noise studies. Impacts are typically assessed at existing noise-sensitive receptors by estimating noise level increases and future noise levels due to the additional traffic

[2] Environmental Guide for Noise, MTO October 2006

accommodated by the improved road. This project differs from the typical in two main areas, namely 1) existing noise-sensitive receptors will be replaced by the redevelopment and 2) the increase in traffic is due solely to the redevelopment and it is not due to the road improvements. In other words, without redevelopment, there would be no increase in traffic and traffic noise. Ultimately, the future development of existing vacant lands and the re-development of non-vacant lands will have to comply with MECP Publication NPC-300 referred to earlier.

Notwithstanding the above, to guide and assist the future redevelopment of the area, this study determines both the increases in noise levels and the resultant noise levels along the study route due to the predicted increased traffic.

3.1 MTO Noise Guide - General Provisions

Some of the key provisions of the Noise Guide are summarized below. We have added project-specific commentary *(in italics)* where applicable.

a) To determine a noise impact, a comparison is made of future sound levels with and without the proposed improvements. An apples-to-apples comparison can only be done by prediction modelling; future sound levels cannot be measured today, and as such, existing sound levels are not part of the impact analysis where an existing road is improved.

b) Noise prediction calculations must only be undertaken using noise prediction methodologies approved by MECP and MTO (e.g. ORNAMENT[3] (Ontario Road Noise Analysis Method for Environment and Transportation) or STAMINA 2.0 (computer program based on US Federal Highway Administration Highway Noise Prediction Model)).

c) The sound level objective for OLAs is 55 dBA *(similar to the NPC-300 objective for new residential development)* or the ambient, whichever is higher.

d) In addition to OLAs, the most exposed sides of existing dwellings are now included (under the new Noise Guide) in the assessment of noise impacts.

e) Mitigation requirements, if any, are based on OLA noise levels which, unlike noise levels at the 'most exposed side', take advantage of shielding from the dwelling unit.

f) The significance of the noise impact is quantified by the change in sound level as well as the actual sound level.

g) If the change in sound level is less than 5 dBA and the predicted sound level with road improvements is less than 65 dBA, then no mitigation is required.

h) If the change is 5 dBA or more or if the sound level is 65 dBA or more, then noise control measures within the right-of-way should be investigated.

i) Mitigation measures, if required, must be investigated within the right-of-way.

[3] Used in this study.

j) Mitigation measures, if required, must be capable of reducing sound levels by at least 5 dBA averaged over the first row receivers.

k) NSAs include all noise-sensitive land uses.

l) To qualify as an NSA, an NSA must have an OLA associated with a dwelling unit. OLAs must be at ground level adjacent to a residential unit.

m) NSAs are defined to include:

- Private homes such as single-family residences (owned or rental)
- Townhouses (owned or rental)
- Multi-unit buildings, e.g. apartments, with OLAs for use by all occupants
- Hospitals, nursing homes for the aged, where there are OLAs for patients

n) Where retrofit is considered, NSAs can also include:

- residential lands adjacent to an existing freeway *(roadway in our case)* if the lands were approved for residential use before February 8, 1977
- residential lands adjacent to a new freeway *(roadway)* if the lands were approved for residential use before the route was designated
- residential lands adjacent to an expanding freeway *(roadway)* if the lands were approved for residential use before the expansion and where noise controls were not originally required.

o) Where a new freeway/highway *(roadway)* is planned, the following land uses would quality as NSAs in addition to those listed above:

- Educational facilities and daycare centres if there are OLAs for students
- Overnight campgrounds
- Hotels/motels if there are OLAs (e.g. pool area, etc.) for guests.

p) The following do not necessarily qualify as NSAs:

- Apartment balconies above the ground floor
- Educational facilities (except dorms with OLAs for students)
- Churches
- Cemeteries
- Parks and picnic areas
- Daycare centres
- All commercial
- All industrial.

q) The majority of residences in the area must be zoned Residential and taxed as principal residences. This ensures that funds for retrofit are directed to areas of greatest need.

r) Caution should be taken in situations where there is potential for zoning to be changed from noise-sensitive land uses to non-sensitive uses.

s) Noise levels for arterial roads are to be calculated for the 16-hour daytime period (7:00 AM to 11:00 PM). *(Our analysis is based on the day/night traffic split for arterial roads as recommended by MECP. See Section 4.4.)*.

t) Commercial vehicle percentages should be based on data provided by a traffic analyst. If no data is available, the Noise Guide makes recommendations for assumed percentages that vary by type of road. *(Our analysis is based on truck percentages provided by Tatham. See Section 4.4.)*

u) Noise level calculations must be carried out using the posted speed limits. *(Our analysis is based on speed limits observed on-site and confirmed by Tatham. See Section 4.4. The same limits have been used for all scenarios.)*

v) Receiver heights are to be set at 1.2 m above grade 3 m from the house. *(We used a height of 1.5 m as per the MECP guidelines for new housing; this is more conservative since it does not allow as much of a sound level reduction due to ground attenuation if any, and it renders noise barriers slightly less effective.)*

3.2 MTO Noise Guide - Construction Noise

The Noise Guide recommends the following concerning construction noise:

a) Identify noise-sensitive areas.

b) Identify and obey municipal noise control by-law. If the by-law causes hardship or timing issues for the contractor, then the contractor may apply directly to the municipality for an exemption to the by-law.

c) Include general noise control measures (not sound level limits) in the construction contract. In response to noise complaints from the public, check for compliance with the noise control measures stipulated in the contract. If public complaints continue even if the required noise control measures are in effect, then enforce the sound level limits as per MECP construction noise guideline NPC-115.

3.3 Project-Specific Noise Criteria

The noise criteria typically developed for EA traffic noise studies are derived from the MECP and MTO policies described earlier. In summary, the focus is normally on:

- NSAs including:
  - 1st priority - lands zoned Residential and used as such
  - 2nd priority - lands used as residential but zoned non-residential
- OLAs where noise levels are predicted to increase by 5 dBA or more as a result of the proposed road realignment
- OLAs where future sound levels are predicted to increase to 65 dBA or more as a result of the proposed road realignment.

In this case, the above does not apply. As noted earlier, since the entire Study Area is planned for redevelopment we assume no existing NSAs or OLAs will remain and be subjected to increased traffic noise.

4. ANALYSIS PROCEDURES

4.1 Surroundings and Study Area Characteristics

The properties adjacent to Main and Mosley Streets within the Study Area are zoned as described in the following paragraphs beginning at the south-east end of the Study Area at River Road West and working west. See zoning maps in Appendices.

Main Street - The properties along Main Street from River Road West to Stonebridge Boulevard are zoned Downtown Gateway Mixed-Use (DG1) in Zoning By-law 2003-60. From Stonebridge Boulevard to the Nottawasaga River the lands are zoned Downtown Core Mixed-Use (DC1). Schedule 'A' of amending Zoning By-law 2014-92 shows the lands along the south side of Main Street from Beck Street to the Nottawasaga River as being zoned Tourist Commercial (CT).

Mosley Street - All of the lands along Mosley Street from the Nottawasaga River to 6th Street North were rezoned to Beach Areas One and Two Special Exception 18 Zone - (CT-18) - Schedule 'N' and 'I' by amending By-law 2014-92. All of these lands include a Holding (H) designation and some include a Floodplain (F) designation. These designations can be lifted once certain municipal and /or conservation authority requirements have been met.

Currently, the lands along Main Street from River Road West to Stonebridge Boulevard are commercial. From Stonebridge Boulevard to Beck Street the lands on the north side are commercial; the south side, while predominantly commercial, includes three residential dwellings fronting onto Main Street (see Fig 6A). Based on the DDMP concept plan, we assume they will be demolished as the area redevelops.

Mosley Street is commercial from the Nottawasaga River to 5th Street North. We have identified 4 residential dwellings (2 on each side of Mosley Street) between 5th Street North and 6th Street North at the west end of the Study Area (see Fig 6D). Given their CT-18 zoning, we assume they will be demolished as the area redevelops. In the event they are not, as implied in the DDMP concept plan (see Fig 1), we have reviewed the potential noise impacts at these dwellings (see Sec. 5.2 and 5.3).

The configuration of the properties within the Study Area and the locations of existing NSAs and OLAs were derived from air photos, zoning mapping and a site visit.

In summary, the Study Area is heavily commercial at present and is intended to be redeveloped as a mixed-use area containing both commercial and residential uses. The Wasaga Beach DDMP was approved by Council on March 28, 2017, and provides the vision for the future of the downtown including the Study Area.

Main and Mosley Streets are both shown as existing collector streets in the DDMP. Main Street is currently a four-lane road with two lanes in each direction from River Road West to River Road East. The road reduces to three lanes (two westbound and one

eastbound) west of River Road East. Mosley Street is currently a three-lane road with two westbound lanes and one eastbound. (For this study, Main and Mosley Streets are described as running east and west. Some of the Appendix material by others may refer to Mosley Street as being a north-south street.)

4.2 Noise Sources

The primary noise source of concern is future traffic on Main and Mosley Streets.

Roadway noise from both cars and trucks (medium and heavy) have been accounted for in this analysis, and the noise source heights have been established in accordance with MECP criteria.

The MECP traffic noise model is based on vehicles equipped with mufflers in good working condition. It does not account for car stereos, squealing tires, honking horns, etc. The model assumes a steady flow of traffic at the speed limit, an even directional split in traffic, and vehicles equally spaced along centreline throughout the study period.

We note that traffic noise levels are influenced by many factors including the amount of traffic, traffic speed, percent trucks, road grades, source-receiver heights above grade, source-receiver separation distance, changes in terrain type (e.g. asphalt vs. vegetation), and the removal/addition of intervening structures. In this study, the factors warranting further review are traffic volume and road alignment (i.e. centreline location).

It is noted that separation distance is defined as the distance between the centreline of travel and receptor. In cases where the separation distance increases, sound levels reduce; in cases where the distance decreases, sound levels increase. Higher noise levels from traffic on the near side of the centreline are generally offset by lower levels from the far side. Assuming an even directional split in traffic, average noise levels are assumed to originate from traffic along the centreline of pavement.

The MECP allows the above approach for roads with up to four lanes of through traffic. For roads with more than four through lanes, separate analyses must be carried out for each direction of travel (in sets of up to four lanes each). In this analysis, we have assumed an even directional split in traffic with noise originating from the centreline.

The DDMP proposes five roundabouts within the Study Area – see Figure 1. Although roundabouts can reduce traffic sound levels due to slower speeds and less braking and acceleration as compared to controlled intersections, we have assumed through traffic.

It is noted that there may be other noise sources in the area (e.g. River Road East, River Road West, other local streets, commercial operations, recreational activities, etc.) that contribute to the ambient noise level in the area. These are not accounted for in this study since the focus of this assessment is the potential increase in traffic noise resulting from the proposed road improvements.

4.3 Noise-Sensitive Areas

As indicated in Section 3.3, we assume there are no existing NSAs or OLAs that will remain following the redevelopment of the area. We have, however, reviewed the noise impacts at the four dwellings on Mosley Street identified in Section 4.1 in the event they remain. See Section 5.2 for the analysis.

4.4 Traffic Data

Future traffic volumes were derived from Peak Hour projections provided by Tatham. They provided Year 2026, 2031 and 2041 projections with Year 2041 representing full build-out and Year 2031 representing 50%. The data includes future traffic volumes under both existing (i.e. "do nothing") and proposed conditions.

This analysis is based on the Year 2041 full build-out scenario.

As indicated earlier, most of the existing development along Main and Mosley Streets and the beach will be removed and replaced with new development. Also as indicated earlier, the total traffic volumes predicted for Year 2041 will be realized only if the area is redeveloped. 'Do nothing' simply means not improving the road which in this case assumes the adjacent lands are not redeveloped.

We have divided the Study Area into nine distinct segments, five for Main Street and four for Mosley Street. They each vary in terms of the predicted future background and total traffic volumes and centreline shifts. A description of the segment locations follows.

TABLE 2A – Road Segments and Descriptions

Street	Segment	Description
Main	A	River Road West to Stonebridge Boulevard
	B	Stonebridge Boulevard to Beck Street
	C1	Beck Street to River Road East
	C2	Beck Street to River Road East
	D	River Road East to Jenetta Street
Mosley	E	Jenetta Street to 1st Street North
	F	1st Street North to 2nd Street North
	G	2nd Street North to 3rd Street North
	H	3rd Street North to 6th Street North

In all cases, the future road cross-section will include one lane in each direction together with a centre left-turn lane. For most of Main Street, this means a reduction in through lanes from four to two with the roadway remaining symmetrical along its centreline. For about one-half of Mosley Street, the reduction is from three to two lanes.

MTO and MECP require traffic noise assessments to be based on the higher of Annual

Average Daily Traffic (AADT) and Summer Average Daily Traffic (SADT). They also require a minimum 10-year traffic volume projection. This assessment is based on Year 2041 SADT figures, thereby meeting and exceeding those requirements.

The following summary of the traffic volume projections (to Year 2041) and proposed centreline shifts was derived from information provided by Tatham.

TABLE 2B – Future Traffic Volumes and Alternative Centreline Shifts

		Year 2041 Traffic Projections (SADT)		Centreline Shift (m) Alternatives		
Street	**Segment**	**Background**	**Total**	**1**	**2**	**3**
Main	A	5,130	16,480	1.90 s	1.05 s	0.70 s
	B	6,980	19,180	1.90 s	1.05 s	0.70 s
	C1	6,810	17,920	1.90 s	1.05 s	0.70 s
	C2	6,810	17,920	0.15 s	0.55 n	0.90 n
	D	8,980	19,660	0.15 s	0.55 n	0.90 n
Mosley	E	7,860	18,540	4.00 s	6.00 n	1.00 n
	F	7,580	18,250	4.00 s	6.00 n	1.00 n
	G	6,870	17,540	-	-	-
	H	7,310	17,990	-	-	-

Notes:
1. 's' denotes South and 'n' denotes North. The Study Area route is assumed to run east-west.
2. SADT values were estimated by multiplying Summer Weekday PM Peak Hour values by 10.
3. There will be no centreline shift in Segments G and H.
4. Traffic Projections are given in SADT (Summer Average Daily Traffic)
5. Background Traffic Projections reflect normal growth to Year 2041 without the redevelopment of the Study Area.
6. Total Traffic Projections reflect growth to Year 2041 with the redevelopment of the Study Area.

See Appendix 'A' for additional traffic data and roadway details.

The current carrying capacities of Main and Mosley Streets exceed the future traffic projections as evidenced by the proposed reduction of lanes throughout most of the Study Area. As a result, we can assume that the road improvements will in themselves not generate additional traffic – in other words, the projected Year 2041 summer weekday traffic volumes can be accommodated with or without the improvements.

The currently posted speed limits are not expected to change during the 20-year study period; therefore, the current limits were used for all scenarios. These are 50 kph from River Road West to Beck Street and 40 kph from Beck Street to 6th Street North.

Tatham has indicated that truck traffic represents 4% of the total, and we have assumed this is split 50/50 between medium and heavy trucks.

Our analysis assumes a day/night traffic split of 90/10 as recommended by the MECP for arterial roads.

We have assumed that the truck percentages and the day/night split will remain constant for the duration of the 20-year study period.

Road grades are flat (<2%) throughout the Study Area and are not expected to change.

The sound level calculations in this study are based on infinite road lengths unless indicated otherwise, and since the road is relatively flat no adjustments were necessary to account for noise from heavy trucks on uphill climbs.

The terrain between the proposed road and the noise-sensitive receptors is assumed to be reflective for this analysis, and shielding by intervening vegetation and buildings has not been accounted for unless noted otherwise.

4.5 Study Period

The key study period, as per the Noise Guide, is daytime from 7:00 AM to 11:00 PM.

4.6 Sound Level Prediction Model

Noise level predictions were carried out per Environmental Noise Assessment in Land Use Planning (MECP 1987) and per MECP roadway noise model ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation) as implemented by MECP roadway noise modelling software Stamson 5.04.

Sample noise level calculations are provided in the Appendices.

4.7 Correction Factors

Typical corrections required by the MECP to be applied to the noise levels have been taken into account where applicable. These include corrections for such things as:

a) Road grade
b) Roadway segment lengths
c) Ground surface type
d) Source - receiver distance
e) Height of elevated source/receiver, and
f) Day/night split in traffic volumes.

5. CALCULATED EQUIVALENT SOUND LEVELS

Outdoor living area sound levels are typically calculated for receivers located 3.0 m from the rear wall of a house, with a receiver height of 1.5 m above finished grade. It is noted that noise barriers may not protect against noise levels where decks, balconies, or roof-

top terraces are provided. Resultant noise levels in these locations may, therefore, be higher than the allowable limit. (We note that decks and balconies are exempt from the NPC-300 outdoor noise limits unless they are the only outdoor living area available to the resident, and they are at least 4.0 m deep, outside the building façade, and unenclosed. And the Noise Guide considers OLAs only if they are at grade.)

Noise levels along a wall on the far (shielded) side of a building are typically 15 dBA less than those not shielded, and noise levels along a side wall, that is, in areas exposed to one-half of the road length, are typically 3 dBA less than those in fully exposed areas.

5.1 Sound Level Contours

To put the traffic noise levels into perspective, we have developed sound level contours for Year 2041 following redevelopment. The contours for 55, 60 and 65 dBA are shown graphically in Figure 6; they help to identify properties where further review may be required. The contours are based on the separation distances given in Table 4.

5.2 Sound Level Increases

To quantify the noise impact of the proposed road improvements, we have compared the proposed Year 2041 sound levels (i.e. with the proposed improvements in place) to those assuming the status quo, that is, assuming no road improvements (i.e. "do nothing") and allowing for normal growth limited only by the physical road capacity where applicable. This approach compares future proposed noise levels to future ambient noise levels as stipulated in the MTO Noise Guide (see Section 3.1).

Increases of less than 5 dBA do not warrant noise mitigation according to the Noise Guide, and even if they exceed 5 dBA, mitigation options are typically investigated only within the right-of-way. According to the Noise Guide, noise levels in OLAs must be examined in further detail in cases where daytime outdoor sound levels along the most exposed side of a dwelling increase by more than 5 dBA or where they exceed 65 dBA. Noise controls for highway improvement projects typically relate to noise levels only in OLAs (at ground level) of residential properties, not at the building face.

Noise level increases are expected to exceed 5 dBA along the following sections of road:

- south side of Main St from River Road W to Stonebridge Blvd (Alt 1, 2, 3)
- south side of Mosley St from Jenetta St to 2nd St N (Alt 1 only)
- north side of Mosley St from Jenetta St to 2nd St N (Alt 2 only).

There are no 5 dBA increases under Alternative 3 except as noted above.

We note that some of the increase is due to traffic volume, and some are due to the proposed centreline shifts. See Section 5.3.

As indicated earlier, four residential dwellings were identified along Mosley Street between 5th and 6th Street North (see Fig 6D). In the event these remain following the

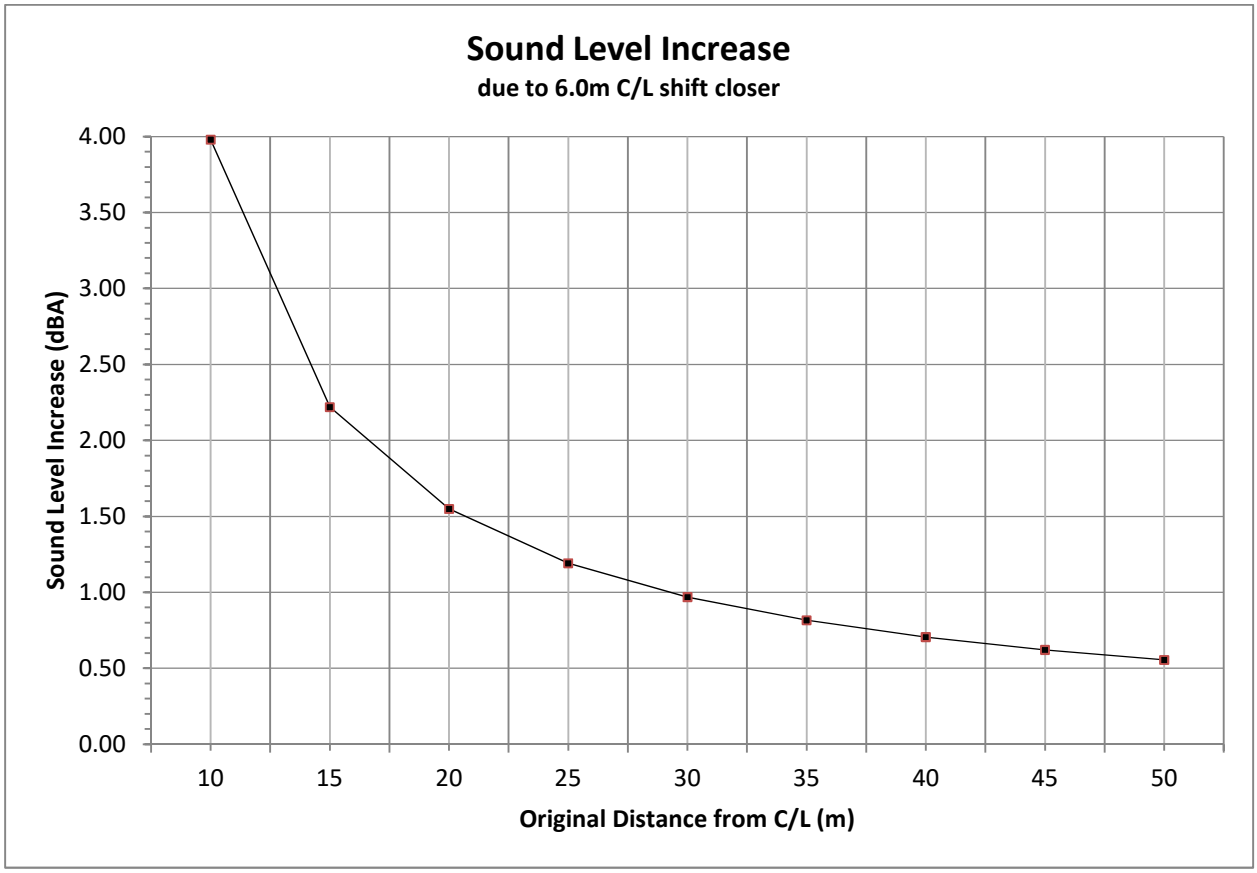
redevelopment of the area, noise mitigation is not required because the predicted future sound level increases (i.e. 3.9 dBA, see Appendices) at the most exposed sides are less than 5 dBA and the predicted future sounds levels are less than 65 dBA (see Fig 6D).

5.3 Predicted Year 2041 Sound Levels

As indicated earlier, an impact is deemed to occur only if noise levels increase as a direct result of the proposed improvements, not simply as a result of normal traffic growth. Hence the need to compare future sound levels under the 'do nothing' and 'proposed' scenarios. Generally speaking, there is no impact if the number of lanes and centreline alignment remains unchanged. In this case, the number of lanes decreases.

Even without changes in traffic volume, changes in alignment can increase/decrease sound levels. We have examined the effect of the proposed shifts (Alternatives 1 to 3) and have found the increases due to shifts alone to be below 5 dBA. See below.

Intuitively, we know that the acoustic effect of a shift is greater at close range and that the sound level difference becomes less with distance. The following graph demonstrates this point for the worst-case 6 m shift (Mosley Street ALT 2 Segments E and F). For a 5 dBA increase, a receptor must be located within the road right-of-way.



There is no centreline shift west of 2nd Street North; therefore, sound level increases are due to increased traffic only. The increases in this area are 4.1 dBA for Segment G and 3.9 dBA for Segment H. See Appendices. The latter applies to the four dwellings along Mosley Street at 6th Street North referenced earlier. Since the sound level increase and the future sound levels are both below the limits that warrant the investigation of mitigation options, no further action is required regarding these four dwellings.

Based on the perceived impact of sound level increases summarized in Table 3, the noise impact of the proposed alternatives adjacent to the right-of-way is 'slight' to 'definite' where existing OLAs remain.

TABLE 3 – Perceived Noise Impact Due to Sound Level Increases

Sound Level Increase (dBA)	Change in Subjective Loudness	Perceived Noise Impact
0 - 3	barely noticeable	nil
4 - 5	noticeably louder	slight
6 - 10	almost twice as loud	definite
11 - 15	almost three times as loud	serious
>16	almost four times as loud	very serious

Figure 6, Sound Level Contours, shows the future 55, 60 and 65 dBA contour lines. The contours do not account for shielding by existing vegetation or buildings, and as indicated in Section 4.2, sound levels on the far side of the houses are typically 15 dBA less than unshielded levels, and those along sidewalls are about 3 dBA less. Accordingly, a contour value of 65 dBA at the most exposed side of a residential dwelling implies a noise level of about 50 dBA on the far (shielded) side and about 62 dBA along the sides.

Using the noise contours as a guide, we have identified those areas where the most exposed side is predicted to exceed 65 dBA. See Fig 6A for the section of Main Street between River Road West and Beck Street where 65 dBA is expected to reach just beyond the right-of-way limits. (For the rest of the Study Area, the 65 dBA line is expected to be less than 15 m from centreline, i.e. within or near the right-of-way limit.)

Based on our analysis of future traffic noise levels along Main and Mosley Streets, we have found that the predicted noise level increases exceed the allowable 5 dBA in certain areas; however, as indicated earlier, this criterion does not apply because the existing receptors will be replaced by new development. Also, the increased traffic will not materialize without redevelopment of the area.

It should be noted that the 55 and 60 dBA contours are provided for reference only (as suggested by the Noise Guide); the Noise Guide has no requirements that kick in at those levels. It is also important to note that the 55 and 60 dBA lines assume no screening by intervening buildings or vegetation and they assume reflective ground throughout the Study Area; actual sound levels are expected to be considerably less.

Residential areas beyond the area to be redeveloped will benefit from traffic sound level reductions due to shielding provided by the density of the proposed 'wall' of buildings along the study route – particularly along Main Street. See Figure 1.

Future residential development adjacent to the roads will ultimately have to be designed to meet the NPC-300 criteria. For example, areas above 55 dBA require provisions for adding central air and warning clauses registered on title; over 60 dBA in outdoor living areas requires acoustic barriers, and over 65 dBA requires special architectural building components (e.g. exterior windows, walls and doors).

The future contours shown in Figure 6 were generated using the distances below.

TABLE 4 – Sound Level Contours (dBA)

Road Segment	From - To	Distance from future C/L Pavement (m)					
		2041 w/o redevelopment			2041 with redevelopment		
		Sound Level (Leq16) (dBA)			Sound Level (Leq16) (dBA)		
		55	60	65	55	60	65
Main Street							
A	River Rd W - Stonebridge	55.5	17.6	5.6	178.9	56.6	17.9
B	Stonebridge - Beck	75.9	24.0	7.6	207.8	65.7	20.8
C1	Beck - River Rd E	47.0	14.9	4.7	123.5	39.0	12.3
C2	Beck - River Rd E	47.0	14.9	4.7	123.5	39.0	12.3
D	River Rd E - Jenetta	61.9	19.6	6.2	135.3	42.8	13.5
Mosley Street							
E	Jenetta - 1st	54.0	17.1	5.4	127.5	40.3	12.8
F	1st - 2nd	52.1	16.5	5.2	125.6	39.8	12.6
G	2nd - 3rd	47.3	15.0	4.7	120.6	38.2	12.1
H	3rd - 6th	50.4	15.9	5.0	123.7	39.2	12.4

Notes:
1. Values based on speed limits of 50 kph for Segments A and B and 40 kph for Segments C to H with and without redevelopment.
2. Values assume reflective ground between source and receiver with and without redevelopment.
3. Values based on 4% trucks (2% medium, 2% heavy) with and without redevelopment.
4. The MECP Stamson software does not accommodate distances less than 15m - values estimated only.

6. NOISE IMPACT SUMMARY

As indicated herein, while there are isolated areas where the predicted traffic sound level will exceed 65 dBA and sound level increases will exceed 5 dBA, there are no NSAs or OLAs where this applies given the redevelopment plans for the Study Area.

7. CONCLUSIONS

The proposed improvements will result in sound level increases and future sound levels in OLAs that would normally warrant an investigation for noise mitigation; however, the MECP and MTO noise policies and protocol are intended to protect only existing NSAs and OLAs and not the future development of noise-sensitive uses.

As indicated earlier, future noise-sensitive uses will be subject to the requirements of NPC-300 on a project-by-project basis. Redevelopment applications should, therefore, include noise impact studies (per NPC-300) as part of the planning approvals process to ensure acceptable noise environments.

To summarize, we have reviewed the acoustic implications of Alternatives 1, 2 and 3 and find that they are all acoustically acceptable. Noise mitigation measures are not required for any of the road improvement Alternatives described herein.

Respectfully submitted,

R. BOUWMEESTER & ASSOCIATES

DRAFT

Ralph Bouwmeester, P. Eng.
Principal

REFERENCES

1. Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (MECP Publication NPC-300, Aug 2013 ver. #22)
2. Sound Levels due to Road Traffic (MECP, Publication NPC-206, October 1995)
3. Environmental Noise Assessment in Land Use Planning, MECP Training Manual, (1987)
4. Road and Rail Noise: Effects on Housing (CMHC, Rev. 1981)
5. ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation) (MECP, October 1989)
6. A Protocol for Dealing With Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments (MECP and MTO, February 1986)
7. Noise Policy and Acoustic Standards for Provincial Highways (MTO, Ministry Directive A-1, July 1978)
8. MTO Environmental Guide for Noise (Oct 2006 – v1.1 rev July 2008)

FIGURES

Source: Tatham Engineering

Source: Town of Wasaga Beach

Location Plan

Scale: NTS

FIG. 1

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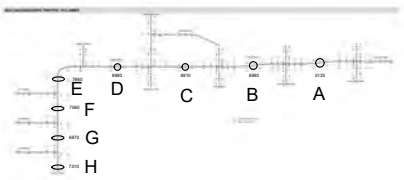

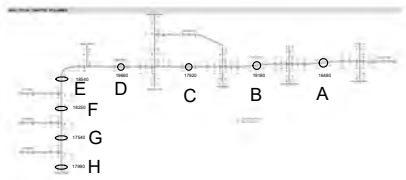

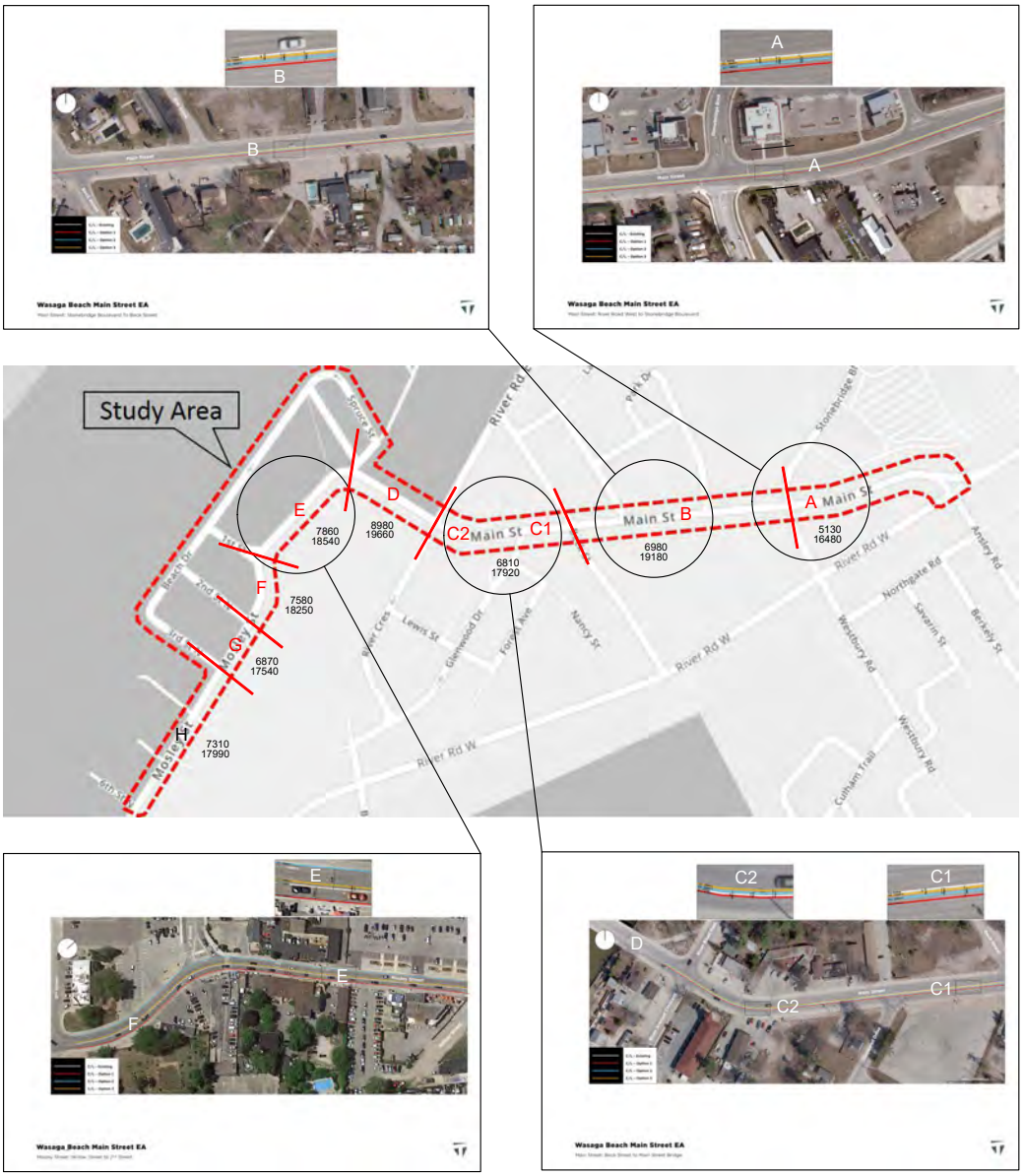

Source: Tatham Engineering

Overview Plan

Scale: NTS

FIG. 2

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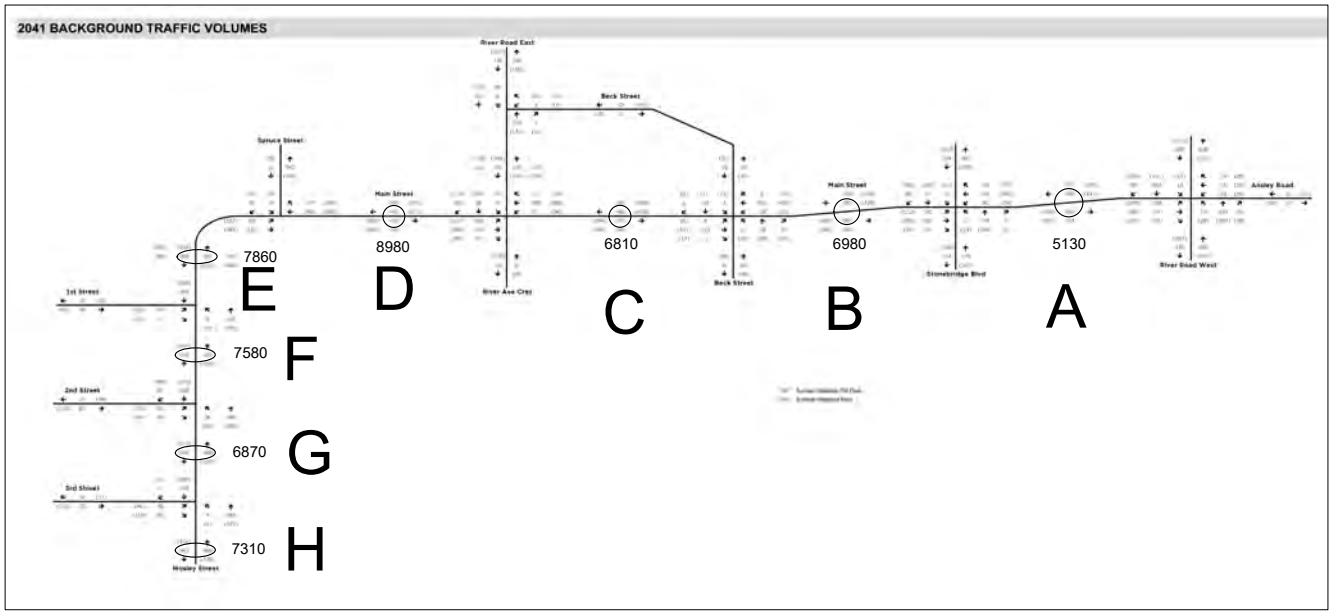
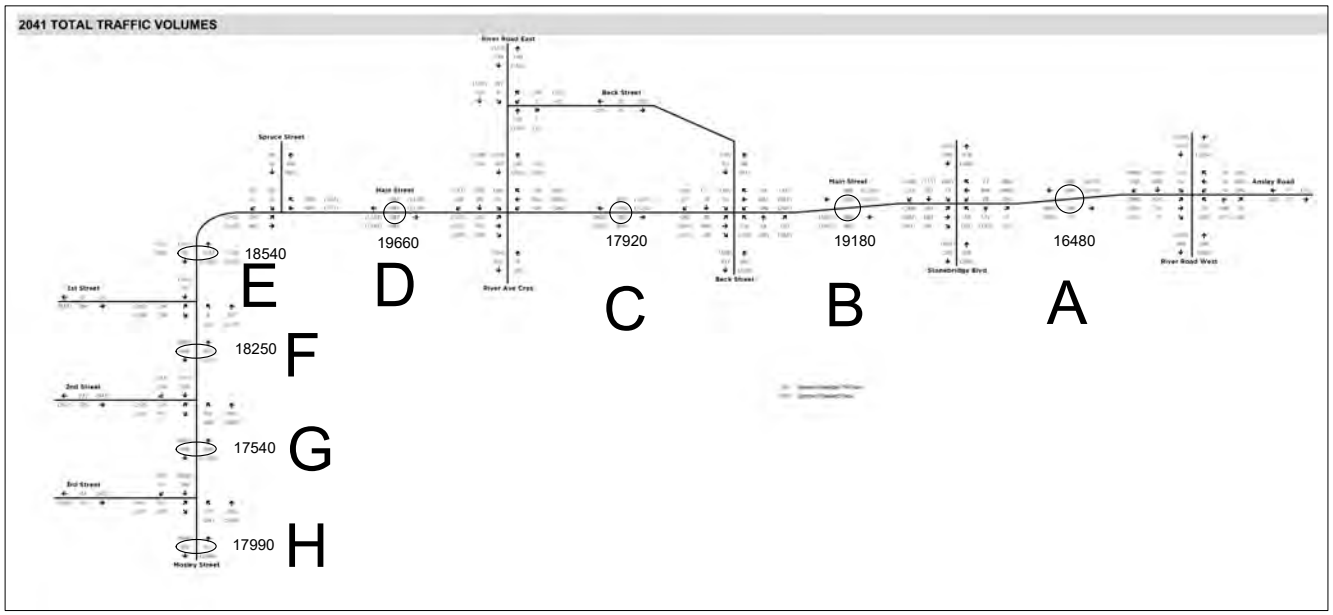
NOTE: See following pages for blow-ups





Source: Tatham Engineering

Road Segments

Scale: NTS

FIG. 3

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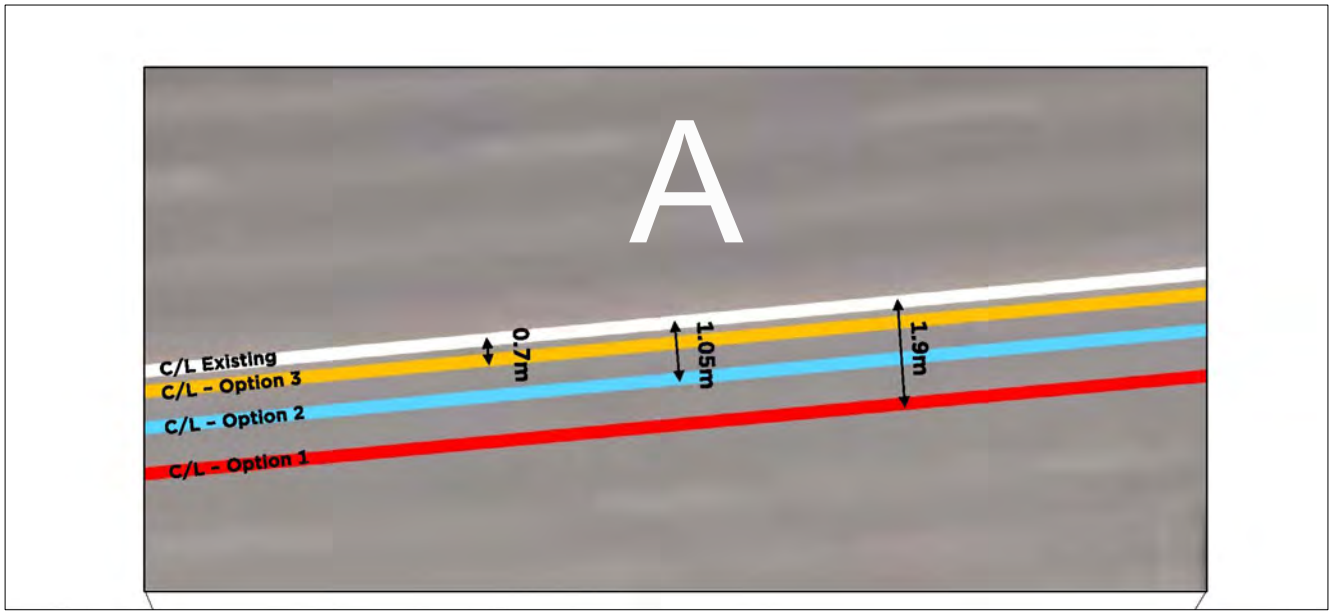

Source: Tatham Engineering

Centreline Shifts

Scale: NTS

FIG. 4A

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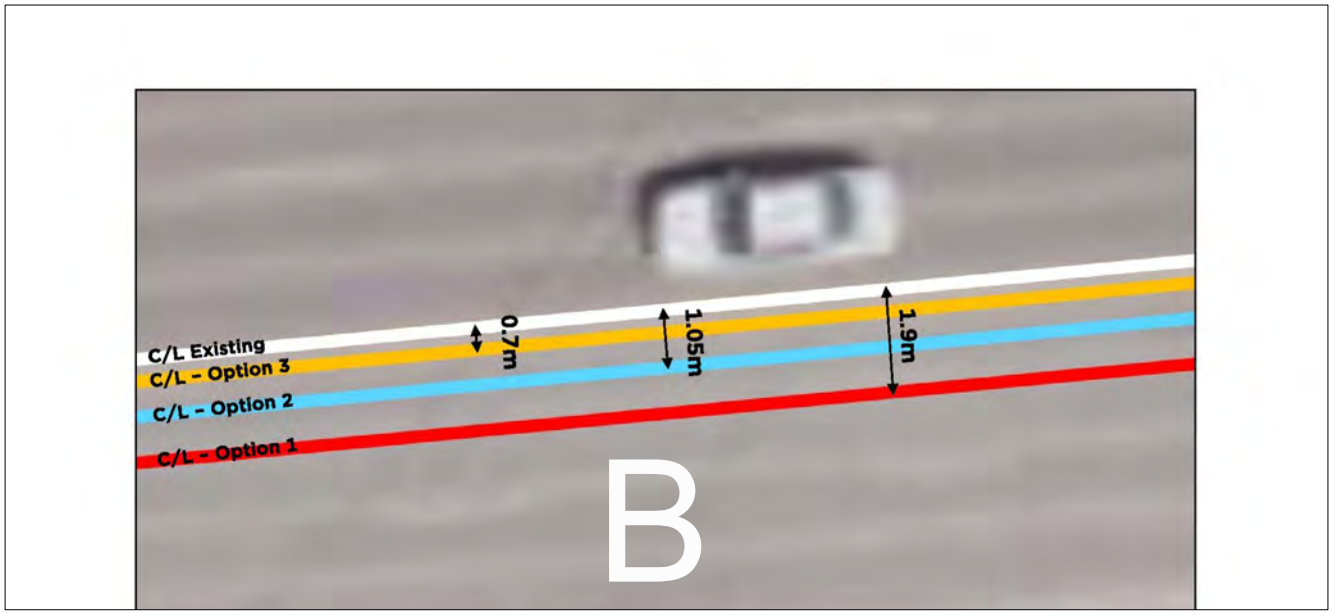

Source: Tatham Engineering

Centreline Shifts

Scale: NTS

FIG. 4B

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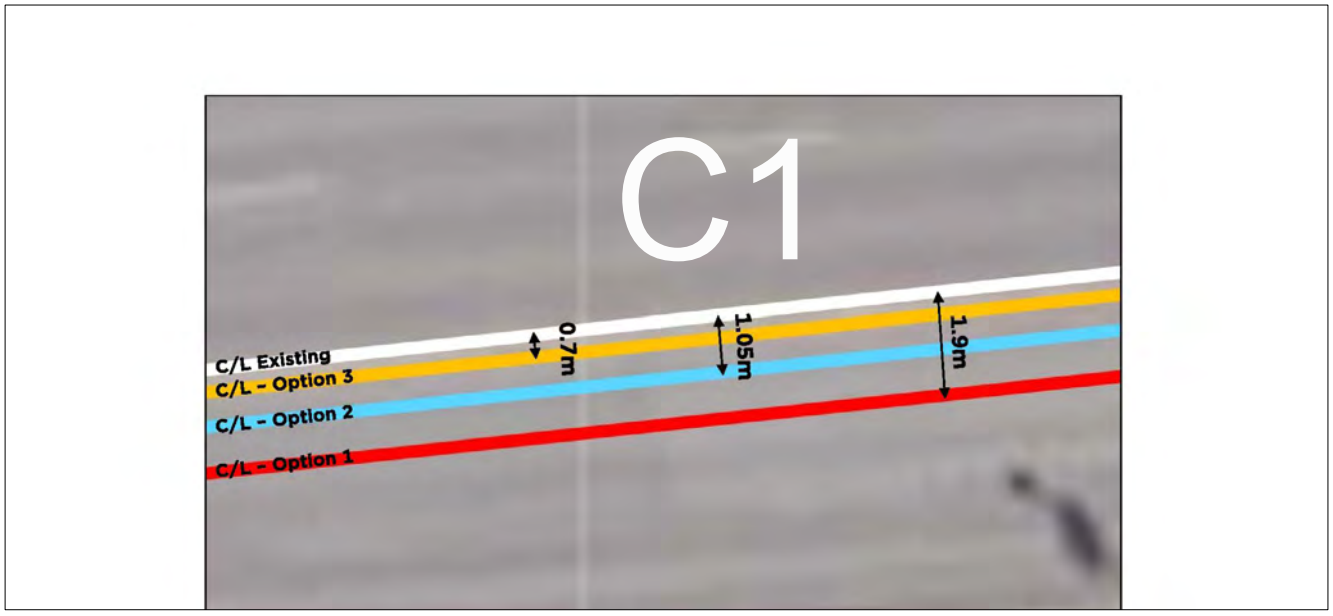

Source: Tatham Engineering

Centreline Shifts

Scale: NTS

FIG. 4C

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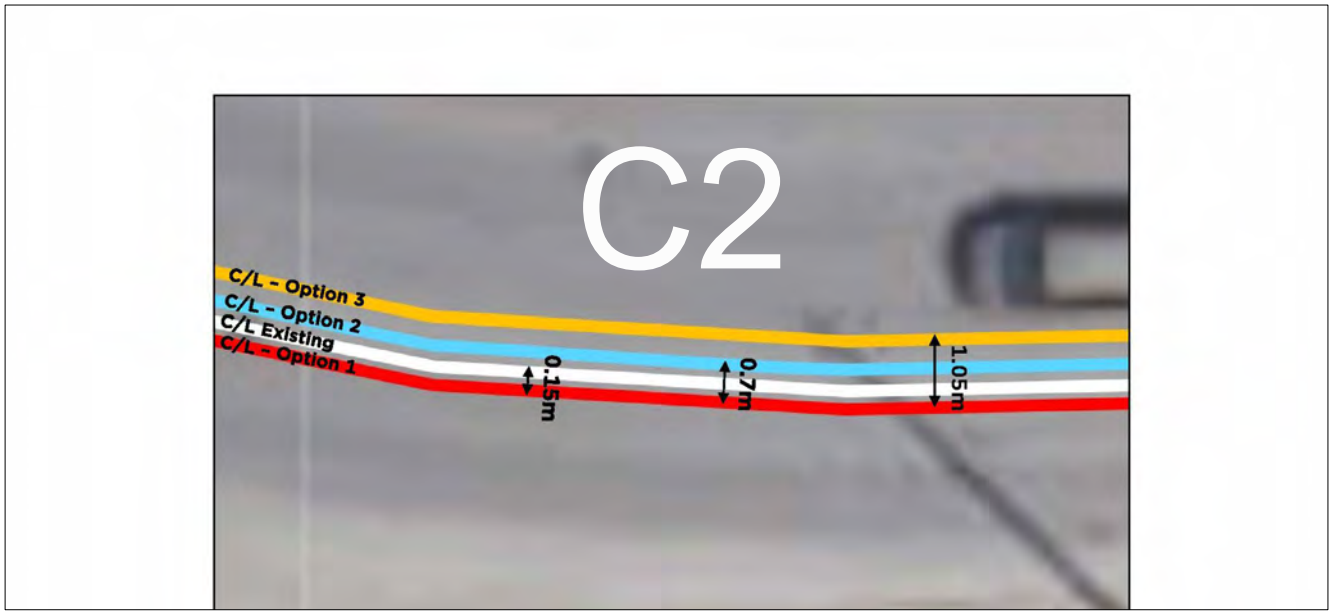

Source: Tatham Engineering

Centreline Shifts

Scale: NTS

FIG. 4D

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Source: Tatham Engineering

Centreline Shifts

Scale: NTS

FIG. 4E

December 2020

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Source: Tatham Engineering

Centreline Shifts

Scale: NTS

FIG. 4F

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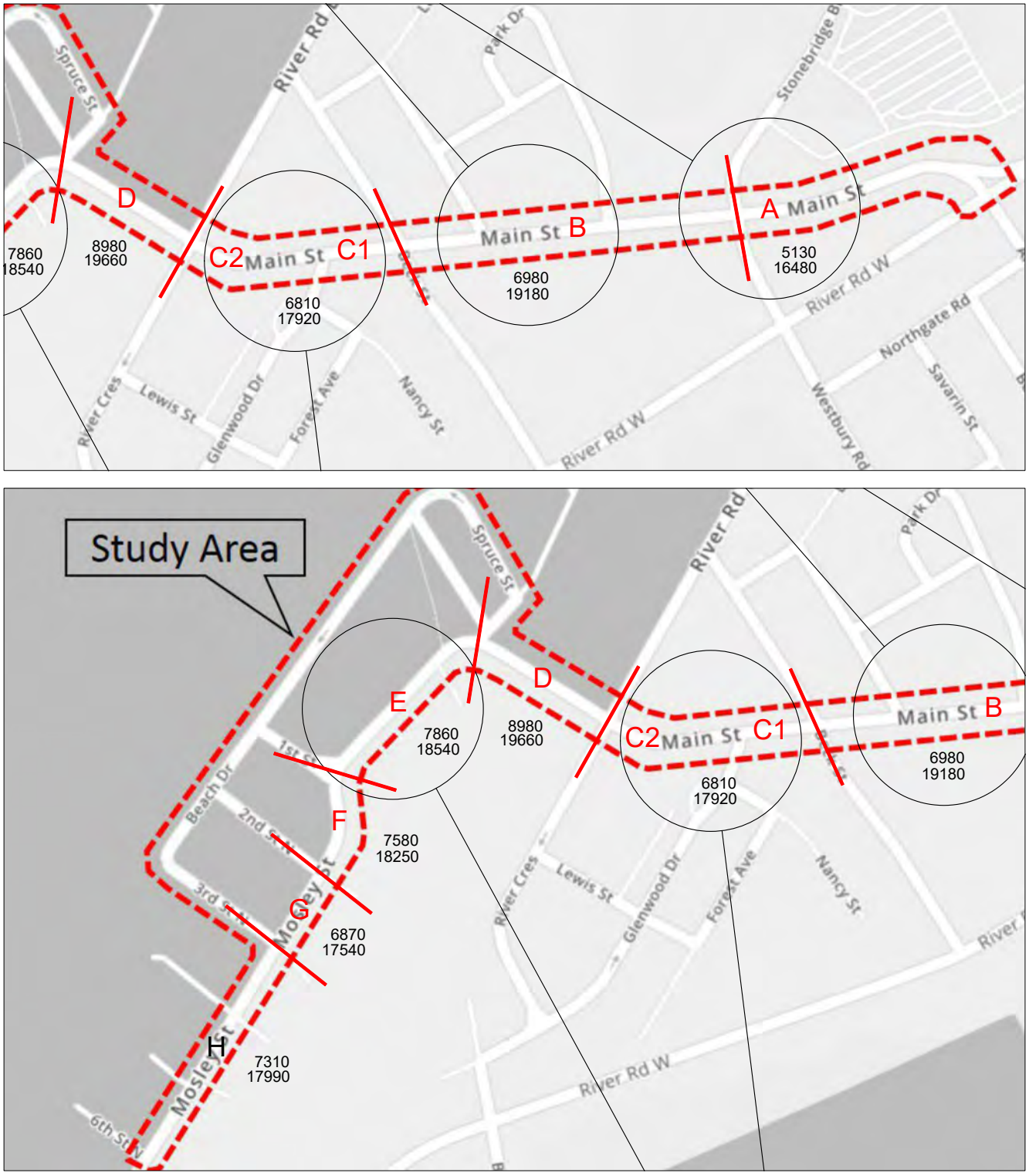

Source: Tatham Engineering

Traffic Volumes

Scale: NTS

FIG. 5

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Legend:

6980	Year 2041 Background Traffic Volume WITHOUT Improvements (SADT)
19180	Year 2041 Total Traffic Volume WITH Improvements (SADT)

Year 2041 Predicted Sound Levels WITH Improvements - ALT 1

Source: Simcoe County Mapping

Legend:

- 65 dBA (shown only if more than 15m from future centreline of travel
- 60 dBA
- 55 dBA
- EX C/L (Proposed C/L shown in white)

Sound Level Contours

Scale: 1:5000

FIG. 6A

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Year 2041 Predicted Sound Levels WITH Improvements - ALT 2

Source: Simcoe County Mapping

Legend:

- 65 dBA (shown only if more than 15m from future centreline of travel
- 60 dBA
- 55 dBA
- EX C/L (Proposed C/L shown in white)

Sound Level Contours

Scale: 1:5000

FIG. 6B

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Year 2041 Predicted Sound Levels WITH Improvements - ALT 3

Source: Simcoe County Mapping

Legend:

- 65 dBA (shown only if more than 15m from future centreline of travel
- 60 dBA
- 55 dBA
- EX C/L (Proposed C/L shown in white)

Sound Level Contours

Scale: 1:5000

FIG. 6C

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Year 2041 Predicted Sound Levels WITH Improvements - ALT 1, 2 3

Source: Simcoe County Mapping

Legend:

- 65 dBA
- 60 dBA
- 55 dBA
- EX C/L (Proposed C/L shown in white)

Sound Level Contours

Scale: 1:5000

FIG. 6D

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APPENDICES

A. Traffic Data
B. Zoning Maps
C. Sample Noise Level Calculations
D. Alternative Centerline Shifts (source: Tatham Engineering)

APPENDIX 'A'

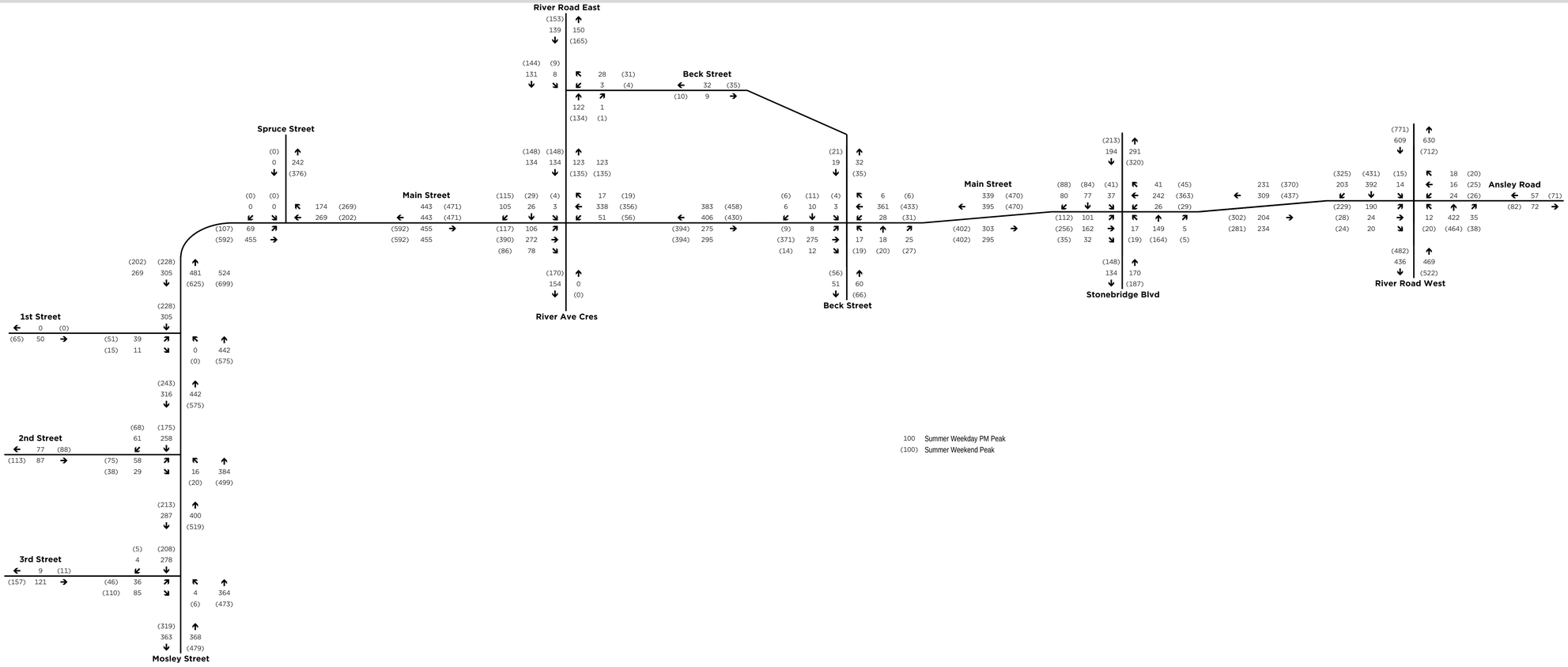
TRAFFIC DATA

Road Seg.	Description	Future Year 2041 Traffic Volumes (SADT) w/o and with improvements		Speed Limit (kph)	Road Grade	% Trucks
MAIN		without	with			
A	River Rd W - Stonebridge	5130	16480	50	<2%	4
B	Stonebridge - Beck	6980	19180	50	<2%	4
C1	Beck - River Rd E	6810	17920	40	<2%	4
C2	Beck - River Rd E	6810	17920	40	<2%	4
D	River Rd E - Jenetta	8980	19660	40	<2%	4
MOSLEY						
E	Jenetta - 1st	7860	18540	40	<2%	4
F	1st - 2nd	7580	18250	40	<2%	4
G	2nd - 3rd	6870	17540	40	<2%	4
H	3rd - 6th	7310	17990	40	<2%	4

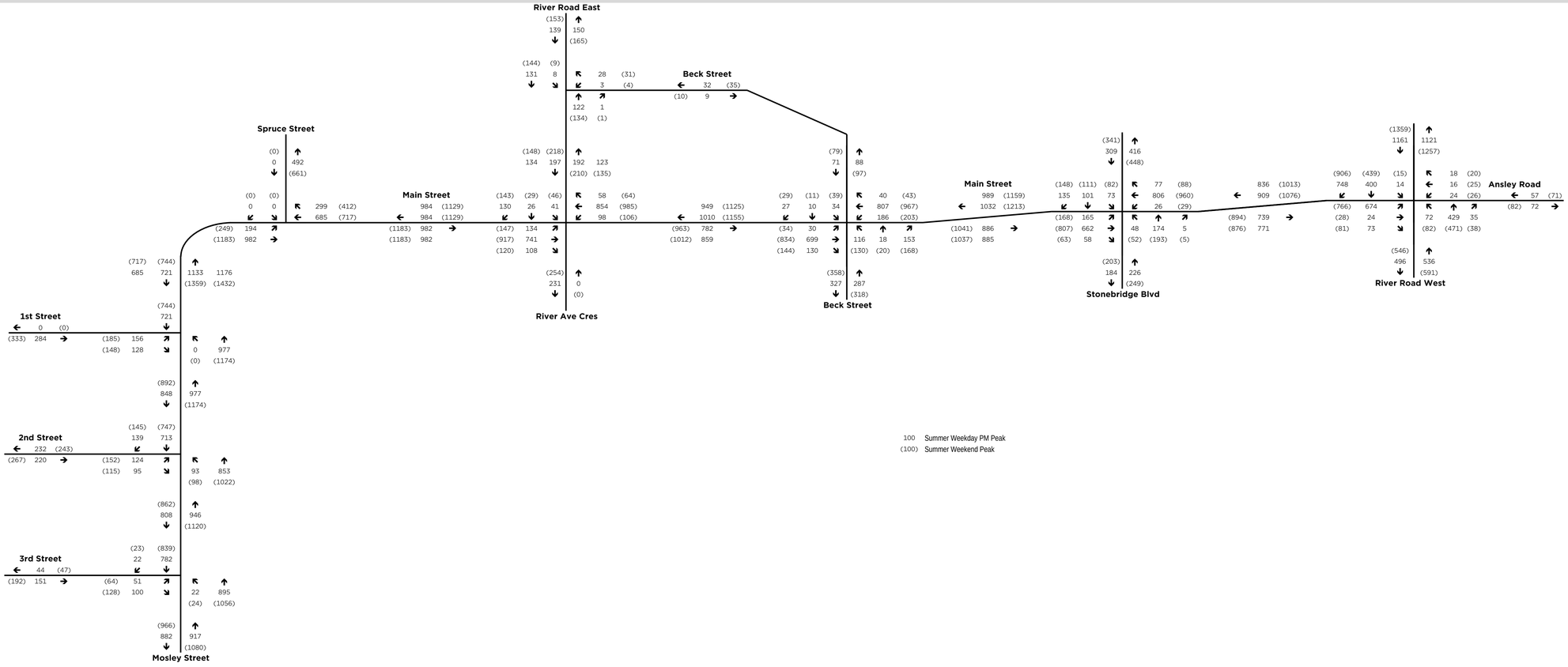
Notes:

1. Truck percentage is assumed split 50/50 between medium and heavy trucks.
2. No changes are expected in speed limit, road grade and truck traffic percentages to Year 2041.
3. Future traffic volumes are derived from Summer Weekday PM Peak Hour Volumes multiplied by 10.
4. For Peak Hour Volumes see Figures by Tatham following.

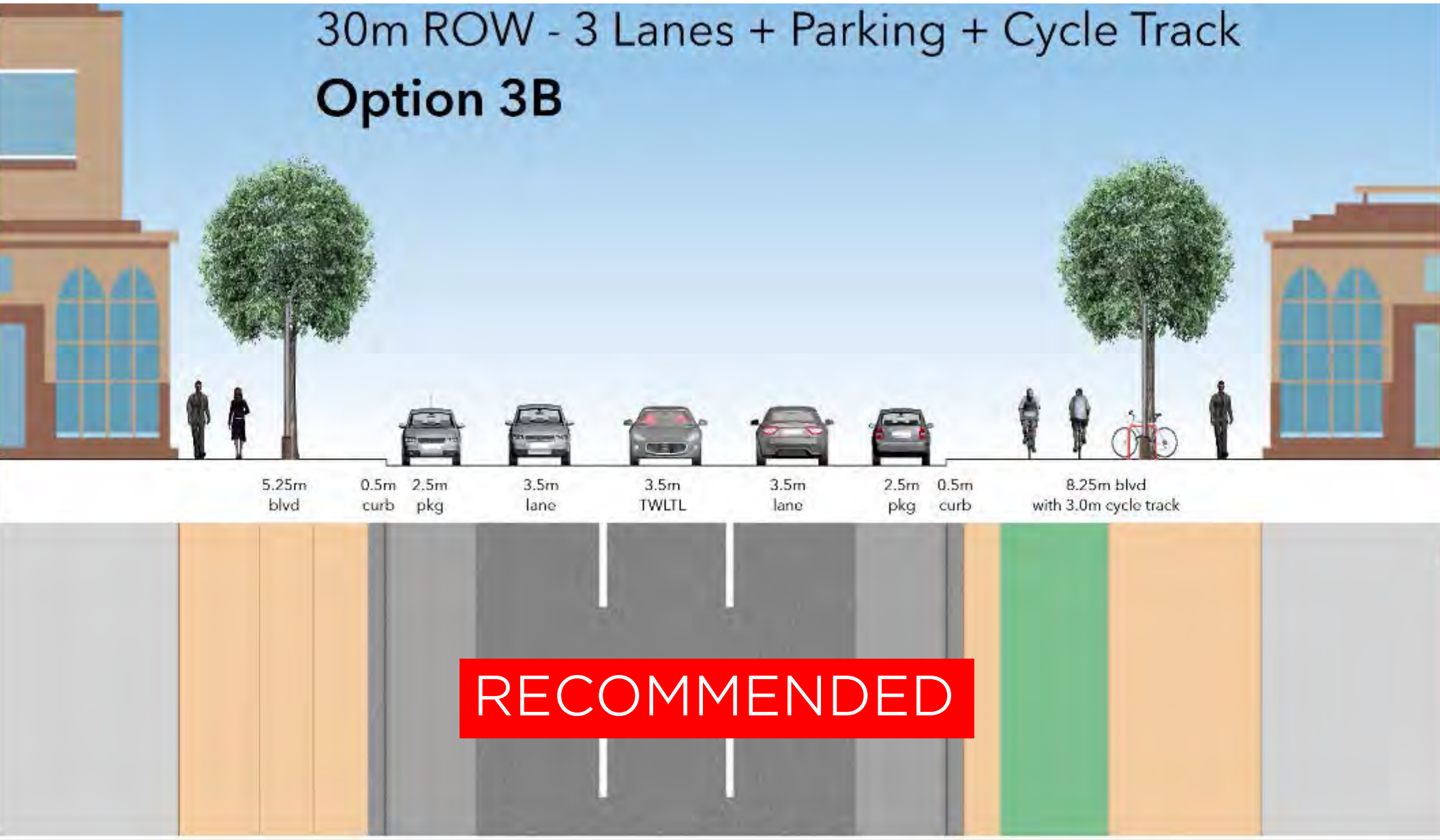
2041 BACKGROUND TRAFFIC VOLUMES



2041 TOTAL TRAFFIC VOLUMES

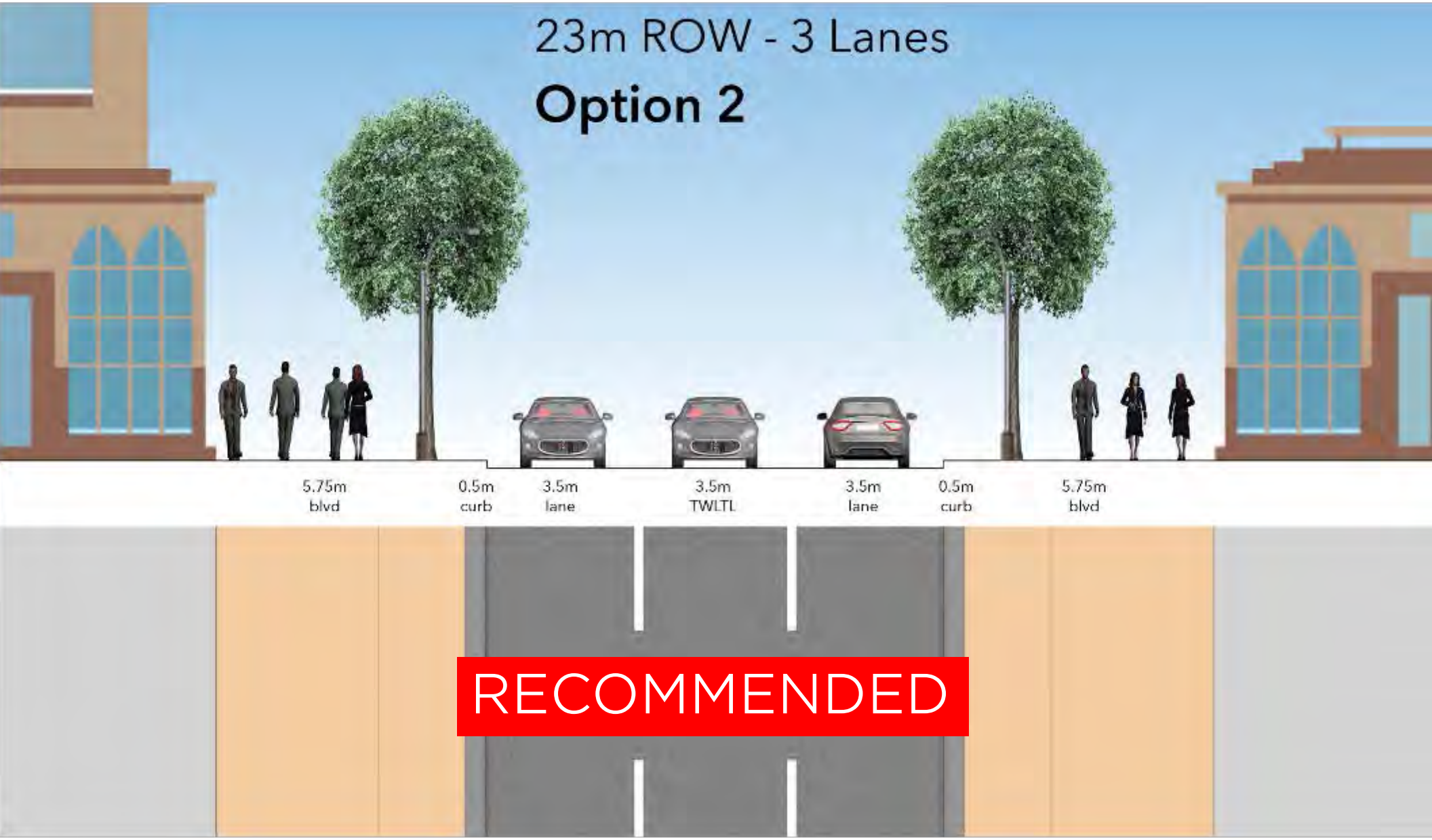


What are the solutions for Main Street?



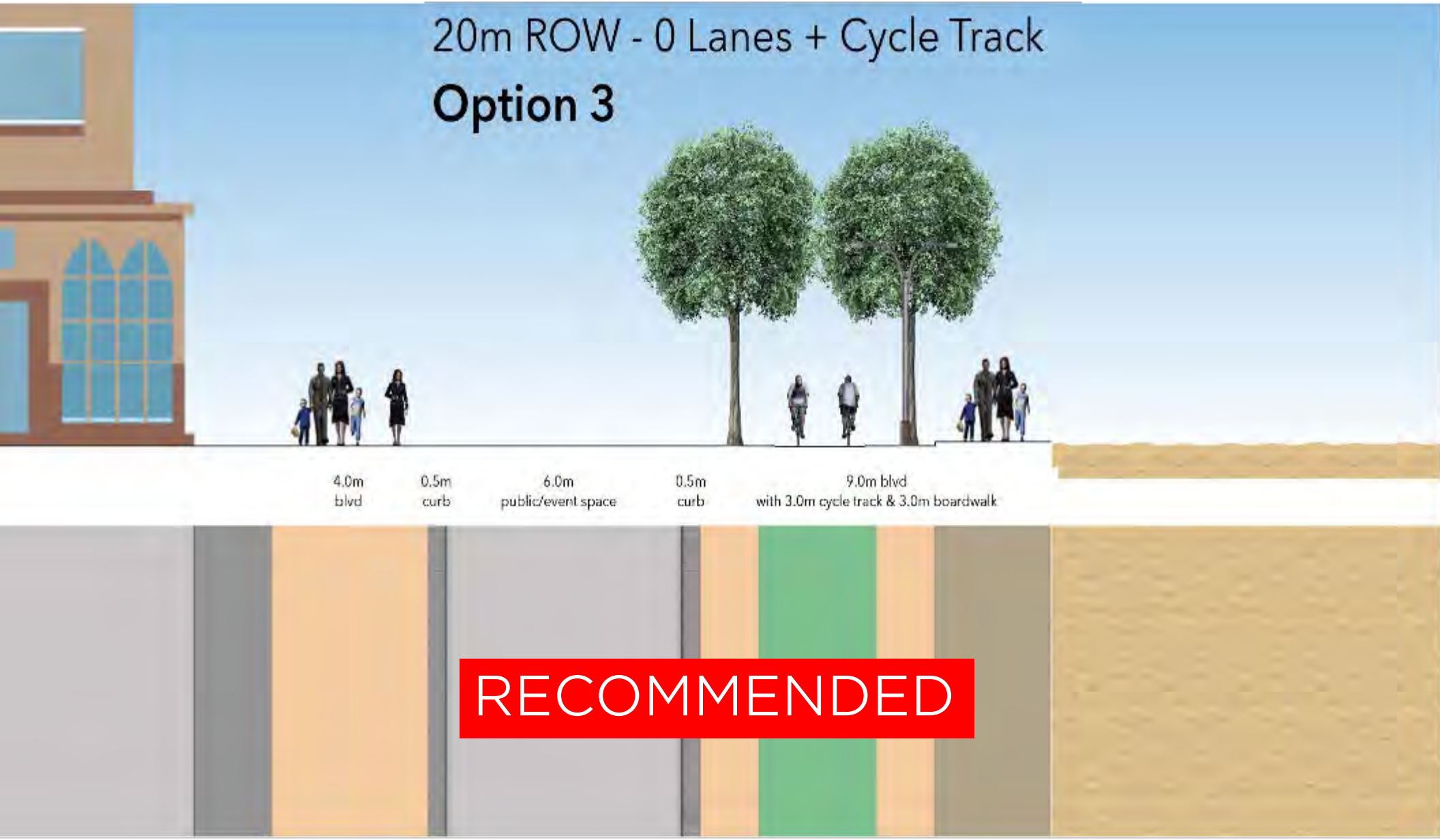
Note: parking lanes can be converted to bump-outs at intersections or at select mid-block locations to increase boulevard space and public realm opportunities

What are the solutions for Mosley Street?



Note: parking bays can be provided within the boulevards on either side through select areas where development and space permit

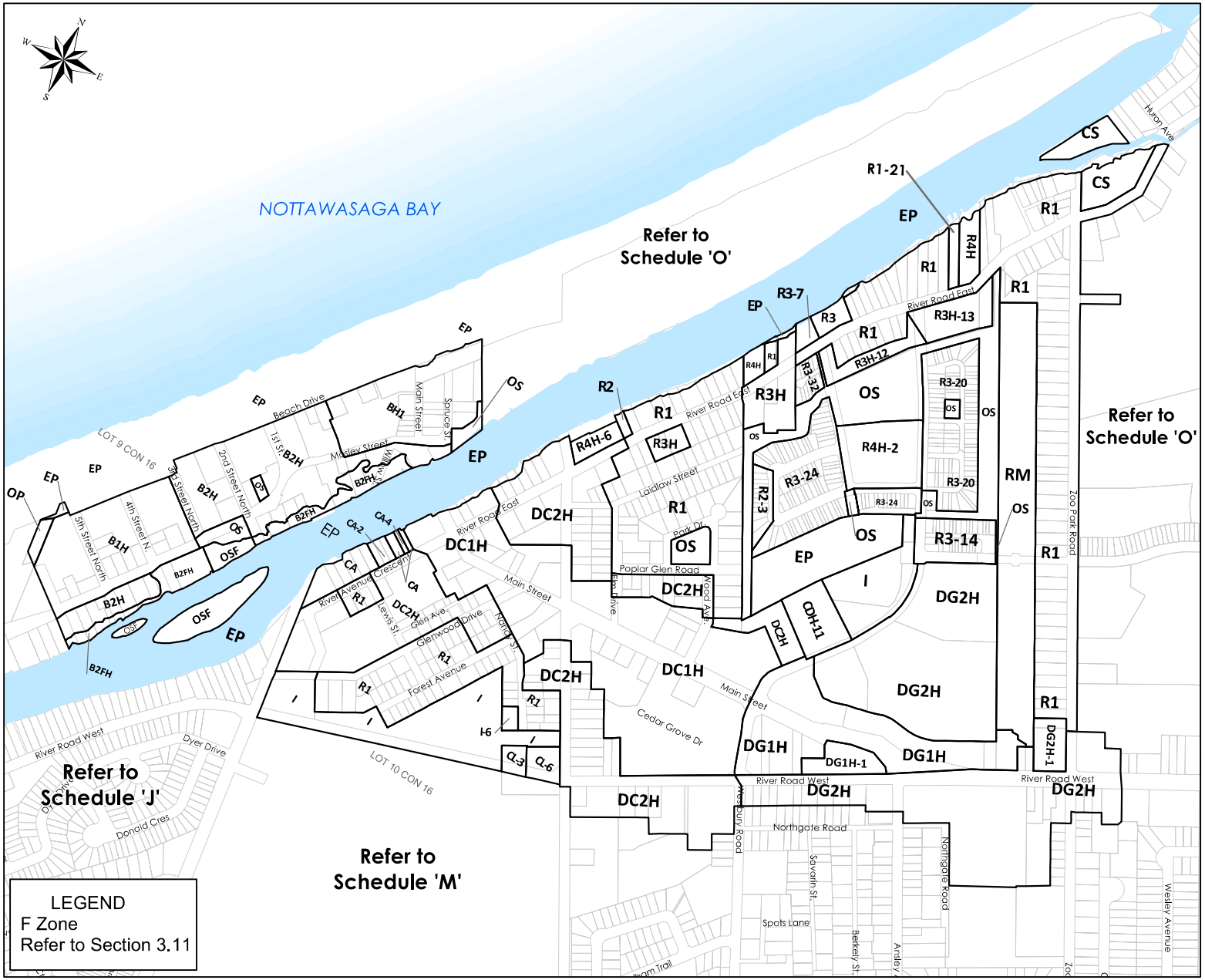
What are the solutions for Beach Drive?



Note: the need for and type of shoreline protection to be confirmed; minimum right-of-way to be confirmed

APPENDIX ‘B’

ZONING MAPS



SCHEDULE 'N'

TOWN OF WASAGA BEACH

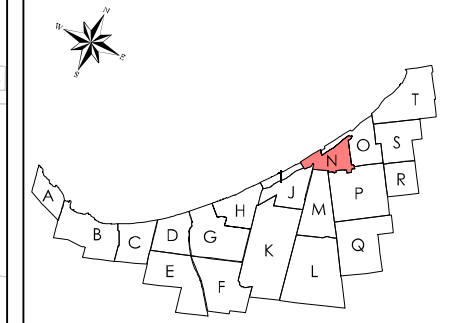
The Beach is Just the Beginning...

WASAGA Beach

THIS IS SCHEDULE 'N' TO BY-LAW 2003-60, PASSED
THE 9th DAY OF September, 2003
SIGNATURES OF SIGNING OFFICERS

MAYOR _____

CLERK _____

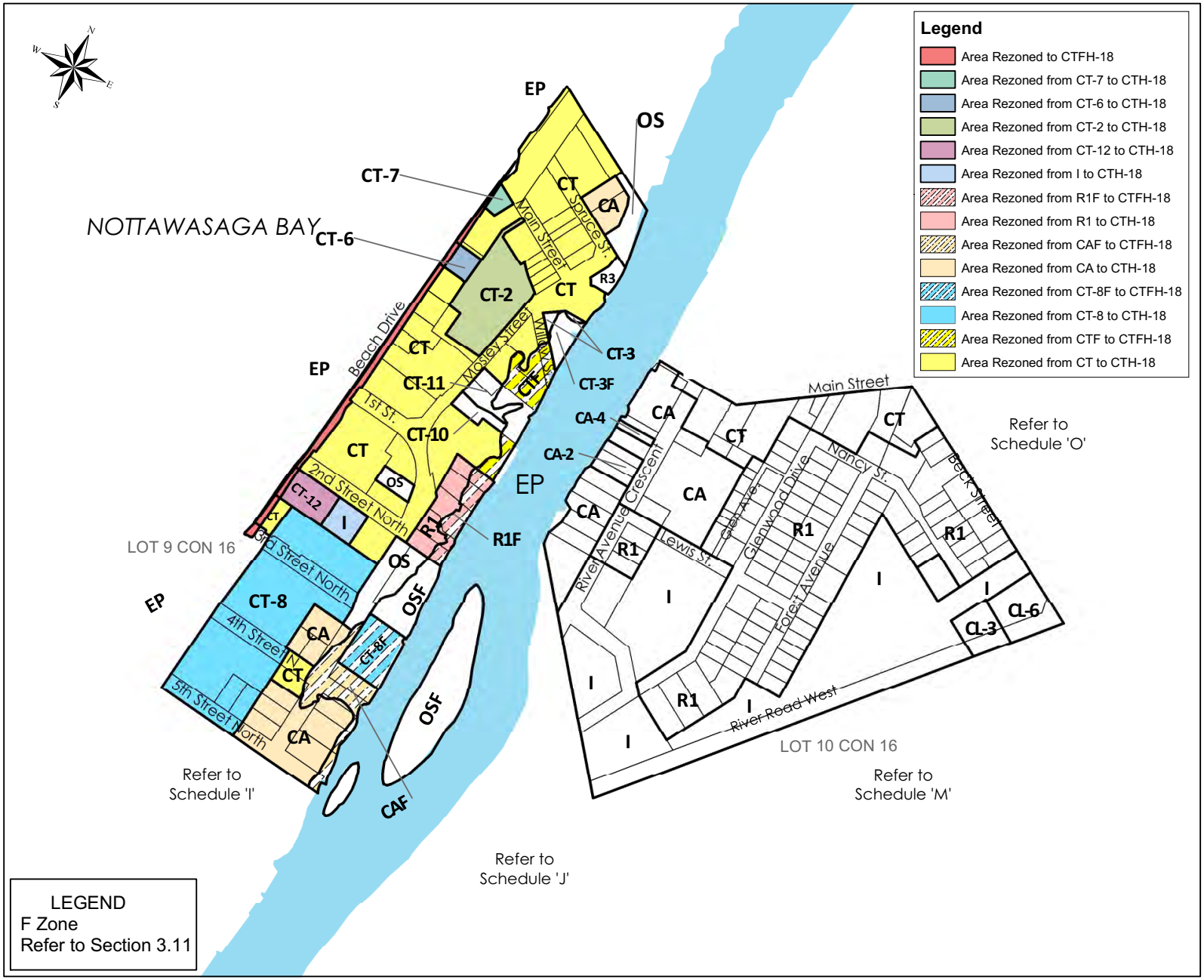


OFFICE CONSOLIDATION
JANUARY 2020

NOTE: The lot lines depicted on this map are for reference purposes only and may not reflect accurately property boundaries in all instances

1:7,000

0 50 100 200 300 400 500 Metres



SCHEDULE 'A'

To Zoning By-law Amendment

No. 2014-_____.

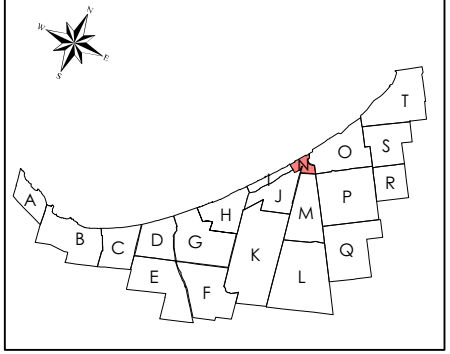
MAYOR _____

CLERK _____

TOWN OF WASAGA BEACH

The Beach is Just the Beginning...

WASAGA Beach

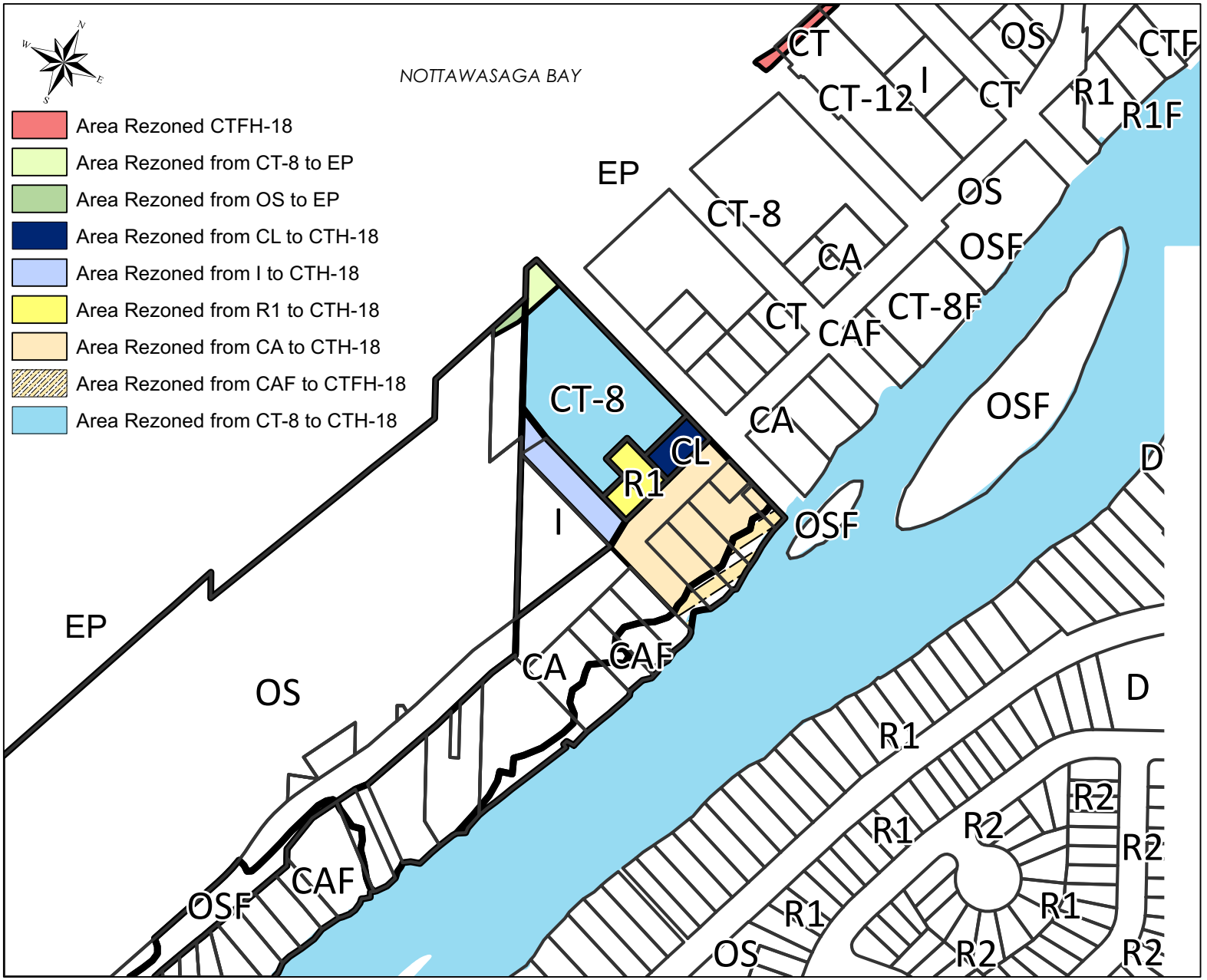


OFFICE CONSOLIDATION
AUGUST 2013

NOTE: The lot lines depicted on this map are for reference purposes only and may not reflect accurately property boundaries in all instances

1:4,330

0 20 40 80 120 160 200 Metres



SCHEDULE 'B'

To Zoning By-law Amendment

No. 2014-_____.

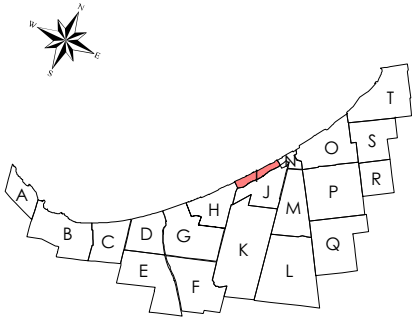
MAYOR _____

CLERK _____

TOWN OF WASAGA BEACH

The Beach is Just the Beginning...

WASAGA Beach



OFFICE CONSOLIDATION
AUGUST 2013

NOTE: The lot lines depicted on this map are for reference purposes only and may not reflect accurately property boundaries in all instances

1:2,597

0 20 40 80 120 160 200

Metres

2.11 PROPOSED LAND USE STRATEGY

In order to support the goals and principles of the master plan (outlined in chapters 4 and 5 of this report), the team has recommended changes to the existing patterns of land use. The proposed land use strategy will guide updates to the Wasaga Beach Official Plan.

APPENDIX 'C'

SAMPLE NOISE LEVEL CALCULATIONS

```
STAMSON 5.0        SUMMARY REPORT        Date: 17-12-2020 11:02:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024aex.te           Time Period: 16 hours
Description: Seg A ex


Road data, segment # 1: Main A ex
----------------------------------
Car traffic volume  :  4432 veh/TimePeriod  *
Medium truck volume :    92 veh/TimePeriod  *
Heavy truck volume  :    92 veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Main A ex
--------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Result summary
--------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Main A ex        !     1.19 !    60.68 !    60.68
--------------------+----------+----------+----------
                      Total                  60.68 dBA


TOTAL Leq FROM ALL SOURCES:       60.68
```

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:07:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024afut.te Time Period: 16 hours
Description: Seg A fut

Road data, segment # 1: Main A fut

Car traffic volume : 14239 veh/TimePeriod *
Medium truck volume : 297 veh/TimePeriod *
Heavy truck volume : 297 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main A fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main A fut	1.19	65.76	65.76
Total			65.76 dBA

TOTAL Leq FROM ALL SOURCES: 65.76

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:03:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024bex.te Time Period: 16 hours
Description: Seg B ex

Road data, segment # 1: Main B ex

Car traffic volume : 6031 veh/TimePeriod *
Medium truck volume : 126 veh/TimePeriod *
Heavy truck volume : 126 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main B ex

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main B ex	1.19	62.04	62.04
Total			62.04 dBA

TOTAL Leq FROM ALL SOURCES: 62.04

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:07:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024bfut.te Time Period: 16 hours
Description: Seg B fut

Road data, segment # 1: Main B fut

Car traffic volume : 16572 veh/TimePeriod *
Medium truck volume : 345 veh/TimePeriod *
Heavy truck volume : 345 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main B fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main B fut	1.19	66.42	66.42
Total			66.42 dBA

TOTAL Leq FROM ALL SOURCES: 66.42

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:03:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024c1ex.te Time Period: 16 hours
Description: Seg C1 ex

Road data, segment # 1: Main C1 ex

Car traffic volume : 5884 veh/TimePeriod *
Medium truck volume : 123 veh/TimePeriod *
Heavy truck volume : 123 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main C1 ex

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main C1 ex	1.19	59.95	59.95
Total			59.95 dBA

TOTAL Leq FROM ALL SOURCES: 59.95

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:08:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024c1fu.te Time Period: 16 hours
Description: Seg C1 fut

Road data, segment # 1: Main C1 fut

Car traffic volume : 15483 veh/TimePeriod *
Medium truck volume : 323 veh/TimePeriod *
Heavy truck volume : 323 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main C1 fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main C1 fut	1.19	64.15	64.15
Total			64.15 dBA

TOTAL Leq FROM ALL SOURCES: 64.15

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:03:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024c2ex.te Time Period: 16 hours
Description: Seg C2 ex

Road data, segment # 1: Main C2 ex

Car traffic volume : 5884 veh/TimePeriod *
Medium truck volume : 123 veh/TimePeriod *
Heavy truck volume : 123 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main C2 ex

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main C2 ex	1.19	59.95	59.95
Total			59.95 dBA

TOTAL Leq FROM ALL SOURCES: 59.95

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:08:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024c2fu.te Time Period: 16 hours
Description: Seg C2 fut

Road data, segment # 1: Main C2 fut

Car traffic volume : 15483 veh/TimePeriod *
Medium truck volume : 323 veh/TimePeriod *
Heavy truck volume : 323 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main C2 fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main C2 fut	1.19	64.15	64.15
Total			64.15 dBA

TOTAL Leq FROM ALL SOURCES: 64.15

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:05:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024dex.te Time Period: 16 hours
Description: Seg D ex

Road data, segment # 1: Main D ex

Car traffic volume : 7759 veh/TimePeriod *
Medium truck volume : 162 veh/TimePeriod *
Heavy truck volume : 162 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main D ex

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main D ex	1.19	61.15	61.15
Total			61.15 dBA

TOTAL Leq FROM ALL SOURCES: 61.15

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:09:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024dfut.te Time Period: 16 hours
Description: Seg D fut

Road data, segment # 1: Main D fut

Car traffic volume : 16986 veh/TimePeriod *
Medium truck volume : 354 veh/TimePeriod *
Heavy truck volume : 354 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main D fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main D fut	1.19	64.55	64.55
Total			64.55 dBA

TOTAL Leq FROM ALL SOURCES: 64.55

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:06:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024eex.te Time Period: 16 hours
Description: Seg E ex

Road data, segment # 1: Mosley E ex

Car traffic volume : 6791 veh/TimePeriod *
Medium truck volume : 141 veh/TimePeriod *
Heavy truck volume : 141 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Mosley E ex

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Mosley E ex	1.19	60.56	60.56
Total			60.56 dBA

TOTAL Leq FROM ALL SOURCES: 60.56

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:09:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024efut.te Time Period: 16 hours
Description: Seg E fut

Road data, segment # 1: Mosley E fut

Car traffic volume : 16019 veh/TimePeriod *
Medium truck volume : 334 veh/TimePeriod *
Heavy truck volume : 334 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Mosley E fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Mosley E fut	1.19	64.30	64.30
Total			64.30 dBA

TOTAL Leq FROM ALL SOURCES: 64.30

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:06:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024fex.te Time Period: 16 hours
Description: Seg F ex

Road data, segment # 1: Mosley F ex

Car traffic volume : 6549 veh/TimePeriod *
Medium truck volume : 136 veh/TimePeriod *
Heavy truck volume : 136 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Mosley F ex

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Mosley F ex	1.19	60.40	60.40
Total			60.40 dBA

TOTAL Leq FROM ALL SOURCES: 60.40

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:09:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024ffut.te Time Period: 16 hours
Description: Seg F fut

Road data, segment # 1: Mosley F fut

Car traffic volume : 15768 veh/TimePeriod *
Medium truck volume : 329 veh/TimePeriod *
Heavy truck volume : 329 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Mosley F fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Mosley F fut	1.19	64.23	64.23
Total			64.23 dBA

TOTAL Leq FROM ALL SOURCES: 64.23

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:06:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024gex.te Time Period: 16 hours
Description: Seg G ex

Road data, segment # 1: Mosley G ex

Car traffic volume : 5936 veh/TimePeriod *
Medium truck volume : 124 veh/TimePeriod *
Heavy truck volume : 124 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Mosley G ex

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Mosley G ex	1.19	59.99	59.99
Total			59.99 dBA

TOTAL Leq FROM ALL SOURCES: 59.99

MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024gfut.te Time Period: 16 hours
Description: Seg G fut

Road data, segment # 1: Mosley G fut

Car traffic volume : 15155 veh/TimePeriod *
Medium truck volume : 316 veh/TimePeriod *
Heavy truck volume : 316 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Mosley G fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Mosley G fut	1.19	64.06	64.06
Total			64.06 dBA

TOTAL Leq FROM ALL SOURCES: 64.06

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:07:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024hex.te Time Period: 16 hours
Description: Seg H ex

Road data, segment # 1: Mosley H ex

Car traffic volume : 6316 veh/TimePeriod *
Medium truck volume : 132 veh/TimePeriod *
Heavy truck volume : 132 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Mosley H ex

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Mosley H ex	1.19	60.26	60.26
Total			60.26 dBA

TOTAL Leq FROM ALL SOURCES: 60.26

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:10:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024hfut.te Time Period: 16 hours
Description: Seg H fut

Road data, segment # 1: Mosley H fut

Car traffic volume : 15543 veh/TimePeriod *
Medium truck volume : 324 veh/TimePeriod *
Heavy truck volume : 324 veh/TimePeriod *
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Mosley H fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Mosley H fut	1.19	64.16	64.16
Total			64.16 dBA

TOTAL Leq FROM ALL SOURCES: 64.16

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:12:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024a65.te Time Period: 16 hours
Description: Seg A fut dist 65dBA

Road data, segment # 1: Main A fut

Car traffic volume : 14239 veh/TimePeriod *
Medium truck volume : 297 veh/TimePeriod *
Heavy truck volume : 297 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main A fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 17.90 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
---

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main A fut	1.19	65.00	65.00
Total			65.00 dBA

TOTAL Leq FROM ALL SOURCES: 65.00

STAMSON 5.0 SUMMARY REPORT Date: 17-12-2020 11:12:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 9024b65.te Time Period: 16 hours
Description: Seg B fut dist 65dBA

Road data, segment # 1: Main B fut

Car traffic volume : 16572 veh/TimePeriod *
Medium truck volume : 345 veh/TimePeriod *
Heavy truck volume : 345 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Main B fut

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.80 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Result summary
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	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Main B fut	1.19	65.00	65.00
Total			65.00 dBA

TOTAL Leq FROM ALL SOURCES: 65.00

50 kph Analysis

Road Seg. MAIN	Segment Description	Future Year 2041 Traffic Volumes (SADT) w/o improvements	with improvements	Speed Limit kph	Sound Level Inc. due to traffic vol. increase (dBA)
A	River Rd W - Stonebridge	5130	16480	50	5.07
B	Stonebridge - Beck	6980	19180	50	4.39
C1	Beck - River Rd E	6810	17920	40	4.20
C2	Beck - River Rd E	6810	17920	40	4.20
D	River Rd E - Jenetta	8980	19660	40	3.40
MOSLEY					
E	Jenetta - 1st	7860	18540	40	3.73
F	1st - 2nd	7580	18250	40	3.82
G	2nd - 3rd	6870	17540	40	4.07
H	3rd - 6th	7310	17990	40	3.91

Distance from Original Centreline (m) / Change in Sound Level (dBA)
(based on reflective intervening ground) (WITHOUT improvements)

15	20	25	30	35	40	45	50
	-1.25	-2.22	-3.01	-3.68	-4.26	-4.77	-5.23

Road Seg. MAIN	Alt. No.	C/L Shift (m) (S +ve)	Receiver Location							
				Reference Sound Level (dBA) for 50 kph							
A				**60.68**	59.43	58.46	57.67	57.00	56.42	55.91	55.45
				Sound Level Adjustment due to C/L Shift (dBA)							
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45
			s/side	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45
				Sound Level Adjustment due to C/L Shift (dBA)							
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45
			s/side	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45
				Sound Level Adjustment due to C/L Shift (dBA)							
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45
			s/side	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45
				Reference Sound Level (dBA)							
B				62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79
				Sound Level Adjustment due to C/L Shift (dBA)							
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79
			s/side	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79
				Sound Level Adjustment due to C/L Shift (dBA)							
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79
			s/side	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79
				Sound Level Adjustment due to C/L Shift (dBA)							
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79
			s/side	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79

50 kph Analysis

Road Seg.		Future Year 2041 Traffic Volumes (SADT)		Speed	Sound Level Inc. due to traffic vol.
MAIN	Segment Description	w/o improvements	with improvements	Limit kph	increase (dBA)
A	River Rd W - Stonebridge	5130	16480	50	5.07
B	Stonebridge - Beck	6980	19180	50	4.39
C1	Beck - River Rd E	6810	17920	40	4.20
C2	Beck - River Rd E	6810	17920	40	4.20
D	River Rd E - Jenetta	8980	19660	40	3.40
MOSLEY					
E	Jenetta - 1st	7860	18540	40	3.73
F	1st - 2nd	7580	18250	40	3.82
G	2nd - 3rd	6870	17540	40	4.07
H	3rd - 6th	7310	17990	40	3.91

Distance from Original Centreline (m) / Change in Sound Level (dBA)
(based on reflective intervening ground) (WITH improvements)

15	20	25	30	35	40	45	50
	-1.25	-2.22	-3.01	-3.68	-4.26	-4.77	-5.23

Road Seg. MAIN	Alt. No.	C/L Shift (m) (S +ve)	Receiver Location							
				Reference Sound Level (dBA) for 50 kph							
A				65.75	64.50	63.53	62.74	62.07	61.49	60.98	60.52
				Sound Level Adjustment due to C/L Shift (dBA)							
	1	1.90	n/side	-0.52	-0.39	-0.32	-0.27	-0.23	-0.20	-0.18	-0.16
			s/side	0.59	0.43	0.34	0.28	0.24	0.21	0.19	0.17
				Net Sound Level with Shift (dBA)							
			n/side	65.23	64.10	63.21	62.47	61.84	61.29	60.80	60.36
			s/side	66.34	64.93	63.87	63.02	62.31	61.70	61.16	60.69
				Sound Level Adjustment due to C/L Shift (dBA)							
	2	1.05	n/side	-0.29	-0.22	-0.18	-0.15	-0.13	-0.11	-0.10	-0.09
			s/side	0.32	0.23	0.19	0.15	0.13	0.12	0.10	0.09
				Net Sound Level with Shift (dBA)							
			n/side	65.45	64.28	63.35	62.59	61.94	61.38	60.88	60.43
			s/side	66.06	64.73	63.72	62.89	62.20	61.60	61.08	60.61
				Sound Level Adjustment due to C/L Shift (dBA)							
	3	0.70	n/side	-0.20	-0.15	-0.12	-0.10	-0.09	-0.08	-0.07	-0.06
			s/side	0.21	0.15	0.12	0.10	0.09	0.08	0.07	0.06
				Net Sound Level with Shift (dBA)							
			n/side	65.55	64.35	63.41	62.64	61.98	61.41	60.91	60.46
			s/side	65.96	64.65	63.65	62.84	62.16	61.57	61.05	60.58
				Reference Sound Level (dBA)							
B				66.41	65.16	64.19	63.40	62.73	62.15	61.64	61.18
				Sound Level Adjustment due to C/L Shift (dBA)							
	1	1.90	n/side	-0.52	-0.39	-0.32	-0.27	-0.23	-0.20	-0.18	-0.16
			s/side	0.59	0.43	0.34	0.28	0.24	0.21	0.19	0.17
				Net Sound Level with Shift (dBA)							
			n/side	65.89	64.76	63.87	63.13	62.50	61.95	61.46	61.02
			s/side	67.00	65.59	64.53	63.68	62.97	62.36	61.82	61.35
				Sound Level Adjustment due to C/L Shift (dBA)							
	2	1.05	n/side	-0.29	-0.22	-0.18	-0.15	-0.13	-0.11	-0.10	-0.09
			s/side	0.32	0.23	0.19	0.15	0.13	0.12	0.10	0.09
				Net Sound Level with Shift (dBA)							
			n/side	66.11	64.94	64.01	63.25	62.60	62.04	61.54	61.09
			s/side	66.72	65.39	64.38	63.55	62.86	62.26	61.74	61.27
				Sound Level Adjustment due to C/L Shift (dBA)							
	3	0.70	n/side	-0.20	-0.15	-0.12	-0.10	-0.09	-0.08	-0.07	-0.06
			s/side	0.21	0.15	0.12	0.10	0.09	0.08	0.07	0.06
				Net Sound Level with Shift (dBA)							
			n/side	66.21	65.01	64.07	63.30	62.64	62.07	61.57	61.12
			s/side	66.61	65.31	64.31	63.50	62.82	62.22	61.70	61.24

			Distance from Original Centreline (m)								Distance from Original Centreline (m)								Distance from Original Centreline (m)							
			15	20	25	30	35	40	45	50	15	20	25	30	35	40	45	50	15	20	25	30	35	40	45	50
Road Seg. MAIN	Alt. No.		Sound Level Increases WITH Improvements(dBA) for 50 kph								Future Sound Level (dBA) - WITHOUT Improvements for 50 kph								Future Sound Level (dBA) - WITH IMPROVEMENTS for 50 kph							
A	1	n/side	4.55	4.67	4.75	4.80	4.84	4.87	4.89	4.91	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45	65.23	64.10	63.21	62.47	61.84	61.29	60.80	60.36
		s/side	**5.66**	**5.50**	**5.41**	**5.35**	**5.31**	**5.28**	**5.26**	**5.24**	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45	66.34	64.93	63.87	63.02	62.31	61.70	61.16	60.69
	2	n/side	4.77	4.85	4.89	4.92	4.94	4.96	4.97	4.98	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45	65.45	64.28	63.35	62.59	61.94	61.38	60.88	60.43
		s/side	**5.38**	**5.30**	**5.25**	**5.22**	**5.20**	**5.18**	**5.17**	**5.16**	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45	66.06	64.73	63.72	62.89	62.20	61.60	61.08	60.61
	3	n/side	4.87	4.92	4.95	4.97	4.98	4.99	**5.00**	**5.01**	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45	65.55	64.35	63.41	62.64	61.98	61.41	60.91	60.46
		s/side	**5.28**	**5.22**	**5.19**	**5.17**	**5.16**	**5.15**	**5.14**	**5.13**	60.68	59.43	58.46	57.67	57.00	56.42	55.91	55.45	65.96	64.65	63.65	62.84	62.16	61.57	61.05	60.58
B	1	n/side	3.87	4.00	4.07	4.12	4.16	4.19	4.21	4.23	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79	65.89	64.76	63.87	63.13	62.50	61.95	61.46	61.02
		s/side	4.98	4.82	4.73	4.67	4.63	4.60	4.58	4.56	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79	67.00	65.59	64.53	63.68	62.97	62.36	61.82	61.35
	2	n/side	4.10	4.17	4.21	4.24	4.26	4.28	4.29	4.30	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79	66.11	64.94	64.01	63.25	62.60	62.04	61.54	61.09
		s/side	4.71	4.62	4.58	4.54	4.52	4.51	4.49	4.48	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79	66.72	65.39	64.38	63.55	62.86	62.26	61.74	61.27
	3	n/side	4.19	4.24	4.27	4.29	4.30	4.31	4.32	4.33	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79	66.21	65.01	64.07	63.30	62.64	62.07	61.57	61.12
		s/side	4.60	4.54	4.51	4.49	4.48	4.47	4.46	4.45	62.02	60.77	59.80	59.01	58.34	57.76	57.25	56.79	66.61	65.31	64.31	63.50	62.82	62.22	61.70	61.24

Road Segment	Future C/L Dist for 65 dBA		Dist from original C/L (m) for future 65 dBA for 50 kph		
			Alt 1	Alt 2	Alt 3
MAIN		C/L shift*	1.90	1.05	0.70
A	17.82	n/side	15.92	16.77	17.12
		s/side	19.72	18.87	18.52
		C/L shift*	1.90	1.05	0.70
B	20.74	n/side	18.84	19.69	20.04
		s/side	22.64	21.79	21.44

40 kph Analysis

Road Seg. MAIN	Segment Description	Future Year 2041 Traffic Volumes (SADT) w/o improvements	with improvements	Speed Limit kph	Sound Level Inc. due to traffic vol. increase (dBA)
A	River Rd W - Stonebridge	5130	16480	50	5.07
B	Stonebridge - Beck	6980	19180	50	4.39
C1	Beck - River Rd E	6810	17920	40	4.20
C2	Beck - River Rd E	6810	17920	40	4.20
D	River Rd E - Jenetta	8980	19660	40	3.40
MOSLEY					
E	Jenetta - 1st	7860	18540	40	3.73
F	1st - 2nd	7580	18250	40	3.82
G	2nd - 3rd	6870	17540	40	4.07
H	3rd - 6th	7310	17990	40	3.91

Distance from Original Centreline (m) / Change in Sound Level (dBA)
(based on reflective intervening ground) (WITHOUT improvements)

15	20	25	30	35	40	45	50
	-1.25	-2.22	-3.01	-3.68	-4.26	-4.77	-5.23

Road Seg. MAIN	Alt. No.	C/L Shift (m)	Receiver Location								
				Reference Sound Level (dBA) for 40 kph							
C1				59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
				Sound Level Adjustment due to C/L Shift (dBA)							
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
			s/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
				Sound Level Adjustment due to C/L Shift (dBA)							
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
			s/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
				Sound Level Adjustment due to C/L Shift (dBA)							
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
			s/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
				Reference Sound Level (dBA)							
C2				59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
				Sound Level Adjustment due to C/L Shift (dBA)							
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
			s/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
				Sound Level Adjustment due to C/L Shift (dBA)							
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Net Sound Level with Shift (dBA)							
			n/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
			s/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72

						Sound Level Adjustment due to C/L Shift (dBA)					
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
			s/side	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72
						Reference Sound Level (dBA)					
D				61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92
						Sound Level Adjustment due to C/L Shift (dBA)					
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92
			s/side	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92
						Sound Level Adjustment due to C/L Shift (dBA)					
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92
			s/side	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92
						Sound Level Adjustment due to C/L Shift (dBA)					
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92
			s/side	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92
MOSLEY						Reference Sound Level (dBA)					
E				60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34
						Sound Level Adjustment due to C/L Shift (dBA)					
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34
			s/side	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34
						Sound Level Adjustment due to C/L Shift (dBA)					
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34
			s/side	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34
						Sound Level Adjustment due to C/L Shift (dBA)					
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34
			s/side	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34
						Reference Sound Level (dBA)					
F				60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19
						Sound Level Adjustment due to C/L Shift (dBA)					
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19

			s/side	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19
						Sound Level Adjustment due to C/L Shift (dBA)					
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19
			s/side	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19
						Sound Level Adjustment due to C/L Shift (dBA)					
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
						Net Sound Level with Shift (dBA)					
			n/side	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19
			s/side	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19
							Reference Sound Level (dBA)				
G				59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76
							Sound Level Adjustment due to C/L Shift (dBA)				
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76
			s/side	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76
							Sound Level Adjustment due to C/L Shift (dBA)				
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76
			s/side	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76
							Sound Level Adjustment due to C/L Shift (dBA)				
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76
			s/side	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76
							Reference Sound Level (dBA)				
H				60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03
							Sound Level Adjustment due to C/L Shift (dBA)				
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03
			s/side	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03
							Sound Level Adjustment due to C/L Shift (dBA)				
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03
			s/side	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03
							Sound Level Adjustment due to C/L Shift (dBA)				
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03
			s/side	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03

40 kph Analysis

Road Seg. MAIN	Segment Description	Future Year 2041 Traffic Volumes (SADT) w/o improvements	with improvements	Speed Limit kph	Sound Level Inc. due to traffic vol. increase (dBA)
A	River Rd W - Stonebridge	5130	16480	50	5.07
B	Stonebridge - Beck	6980	19180	50	4.39
C1	Beck - River Rd E	6810	17920	40	4.20
C2	Beck - River Rd E	6810	17920	40	4.20
D	River Rd E - Jenetta	8980	19660	40	3.40
MOSLEY					
E	Jenetta - 1st	7860	18540	40	3.73
F	1st - 2nd	7580	18250	40	3.82
G	2nd - 3rd	6870	17540	40	4.07
H	3rd - 6th	7310	17990	40	3.91

Distance from Original Centreline (m) / Change in Sound Level (dBA)
(based on reflective intervening ground) (WITH improvements)

15	20	25	30	35	40	45	50
	-1.25	-2.22	-3.01	-3.68	-4.26	-4.77	-5.23

Road Seg. MAIN	Alt. No.	C/L Shift (m)	Receiver Location	15	20	25	30	35	40	45	50
C1				Reference Sound Level (dBA) for 40 kph							
				64.15	62.90	61.93	61.14	60.47	59.89	59.38	58.92
				Sound Level Adjustment due to C/L Shift (dBA)							
	1	1.90	n/side	-0.52	-0.39	-0.32	-0.27	-0.23	-0.20	-0.18	-0.16
			s/side	0.59	0.43	0.34	0.28	0.24	0.21	0.19	0.17
				Net Sound Level with Shift (dBA)							
			n/side	63.63	62.51	61.61	60.87	60.24	59.69	59.20	58.76
			s/side	64.74	63.33	62.27	61.42	60.71	60.10	59.57	59.09
				Sound Level Adjustment due to C/L Shift (dBA)							
	2	1.05	n/side	-0.29	-0.22	-0.18	-0.15	-0.13	-0.11	-0.10	-0.09
			s/side	0.32	0.23	0.19	0.15	0.13	0.12	0.10	0.09
				Net Sound Level with Shift (dBA)							
			n/side	63.86	62.68	61.75	60.99	60.34	59.78	59.28	58.83
			s/side	64.47	63.13	62.12	61.29	60.60	60.01	59.48	59.01
				Sound Level Adjustment due to C/L Shift (dBA)							
	3	0.70	n/side	-0.20	-0.15	-0.12	-0.10	-0.09	-0.08	-0.07	-0.06
			s/side	0.21	0.15	0.12	0.10	0.09	0.08	0.07	0.06
				Net Sound Level with Shift (dBA)							
			n/side	63.95	62.75	61.81	61.04	60.38	59.81	59.31	58.86
			s/side	64.36	63.06	62.05	61.24	60.56	59.97	59.45	58.98
				Reference Sound Level (dBA)							
C2				64.15	62.90	61.93	61.14	60.47	59.89	59.38	58.92
				Sound Level Adjustment due to C/L Shift (dBA)							
	1	0.15	n/side	-0.04	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01	-0.01
			s/side	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01
				Net Sound Level with Shift (dBA)							
			n/side	64.11	62.87	61.91	61.12	60.45	59.87	59.36	58.91
			s/side	64.19	62.93	61.96	61.16	60.49	59.91	59.39	58.93
				Sound Level Adjustment due to C/L Shift (dBA)							
	2	-0.55	n/side	0.16	0.12	0.10	0.08	0.07	0.06	0.05	0.05
			s/side	-0.16	-0.12	-0.09	-0.08	-0.07	-0.06	-0.05	-0.05
				Net Sound Level with Shift (dBA)							
			n/side	64.31	63.02	62.03	61.22	60.54	59.95	59.43	58.97
			s/side	63.99	62.78	61.84	61.06	60.40	59.83	59.33	58.87

						Sound Level Adjustment due to C/L Shift (dBA)					
	3	-0.90	n/side	0.27	0.20	0.16	0.13	0.11	0.10	0.09	0.08
			s/side	-0.25	-0.19	-0.15	-0.13	-0.11	-0.10	-0.09	-0.08
						Net Sound Level with Shift (dBA)					
			n/side	64.42	63.10	62.09	61.27	60.58	59.99	59.47	59.00
			s/side	63.90	62.71	61.78	61.01	60.36	59.79	59.29	58.84
						Reference Sound Level (dBA)					
D				64.55	63.30	62.33	61.54	60.87	60.29	59.78	59.32
						Sound Level Adjustment due to C/L Shift (dBA)					
	1	0.15	n/side	-0.04	-0.03	-0.03	-0.02	-0.02	-0.02	-0.01	-0.01
			s/side	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01
						Net Sound Level with Shift (dBA)					
			n/side	64.51	63.27	62.31	61.52	60.85	60.28	59.77	59.31
			s/side	64.60	63.34	62.36	61.56	60.89	60.31	59.80	59.34
						Sound Level Adjustment due to C/L Shift (dBA)					
	2	-0.55	n/side	0.16	0.12	0.10	0.08	0.07	0.06	0.05	0.05
			s/side	-0.16	-0.12	-0.09	-0.08	-0.07	-0.06	-0.05	-0.05
						Net Sound Level with Shift (dBA)					
			n/side	64.71	63.42	62.43	61.62	60.94	60.35	59.83	59.37
			s/side	64.40	63.19	62.24	61.46	60.80	60.23	59.73	59.28
						Sound Level Adjustment due to C/L Shift (dBA)					
	3	-0.90	n/side	0.27	0.20	0.16	0.13	0.11	0.10	0.09	0.08
			s/side	-0.25	-0.19	-0.15	-0.13	-0.11	-0.10	-0.09	-0.08
						Net Sound Level with Shift (dBA)					
			n/side	64.82	63.50	62.49	61.67	60.99	60.39	59.87	59.40
			s/side	64.30	63.11	62.18	61.41	60.76	60.20	59.70	59.25
MOSLEY						Reference Sound Level (dBA)					
E				64.30	63.05	62.08	61.29	60.62	60.04	59.53	59.07
						Sound Level Adjustment due to C/L Shift (dBA)					
	1	4.00	n/side	-1.03	-0.79	-0.64	-0.54	-0.47	-0.41	-0.37	-0.33
			s/side	1.35	0.97	0.76	0.62	0.53	0.46	0.40	0.36
						Net Sound Level with Shift (dBA)					
			n/side	63.27	62.26	61.43	60.74	60.15	59.62	59.16	58.73
			s/side	65.64	64.02	62.84	61.91	61.15	60.50	59.93	59.43
						Sound Level Adjustment due to C/L Shift (dBA)					
	2	-6.00	n/side	2.22	1.55	1.19	0.97	0.82	0.71	0.62	0.56
			s/side	-1.46	-1.14	-0.93	-0.79	-0.69	-0.61	-0.54	-0.49
						Net Sound Level with Shift (dBA)					
			n/side	66.52	64.60	63.27	62.26	61.43	60.74	60.15	59.62
			s/side	62.84	61.91	61.15	60.50	59.93	59.43	58.98	58.58
						Sound Level Adjustment due to C/L Shift (dBA)					
	3	-1.00	n/side	0.30	0.22	0.18	0.15	0.13	0.11	0.10	0.09
			s/side	-0.28	-0.21	-0.17	-0.14	-0.12	-0.11	-0.10	-0.09
						Net Sound Level with Shift (dBA)					
			n/side	64.60	63.27	62.26	61.43	60.74	60.15	59.62	59.16
			s/side	64.02	62.84	61.91	61.15	60.50	59.93	59.43	58.98
						Reference Sound Level (dBA)					
F				64.23	62.98	62.01	61.22	60.55	59.97	59.46	59.00
						Sound Level Adjustment due to C/L Shift (dBA)					
	1	4.00	n/side	-1.03	-0.79	-0.64	-0.54	-0.47	-0.41	-0.37	-0.33
			s/side	1.35	0.97	0.76	0.62	0.53	0.46	0.40	0.36
						Net Sound Level with Shift (dBA)					
			n/side	63.20	62.19	61.37	60.68	60.08	59.56	59.09	58.67

			s/side	65.58	63.95	62.77	61.84	61.08	60.43	59.86	59.36
							Sound Level Adjustment due to C/L Shift (dBA)				
	2	-6.00	n/side	2.22	1.55	1.19	0.97	0.82	0.71	0.62	0.56
			s/side	-1.46	-1.14	-0.93	-0.79	-0.69	-0.61	-0.54	-0.49
							Net Sound Level with Shift (dBA)				
			n/side	66.45	64.53	63.20	62.19	61.37	60.68	60.08	59.56
			s/side	62.77	61.84	61.08	60.43	59.86	59.36	58.91	58.51
							Sound Level Adjustment due to C/L Shift (dBA)				
	3	-1.00	n/side	0.30	0.22	0.18	0.15	0.13	0.11	0.10	0.09
			s/side	-0.28	-0.21	-0.17	-0.14	-0.12	-0.11	-0.10	-0.09
							Net Sound Level with Shift (dBA)				
			n/side	64.53	63.20	62.19	61.37	60.68	60.08	59.56	59.09
			s/side	63.95	62.77	61.84	61.08	60.43	59.86	59.36	58.91
							Reference Sound Level (dBA)				
G				64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
							Sound Level Adjustment due to C/L Shift (dBA)				
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
			s/side	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
							Sound Level Adjustment due to C/L Shift (dBA)				
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
			s/side	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
							Sound Level Adjustment due to C/L Shift (dBA)				
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
			s/side	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
							Reference Sound Level (dBA)				
H				64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
							Sound Level Adjustment due to C/L Shift (dBA)				
	1	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
			s/side	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
							Reference Sound Level (dBA)				
	2	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
			s/side	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
							Reference Sound Level (dBA)				
	3	0.00	n/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			s/side	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
							Net Sound Level with Shift (dBA)				
			n/side	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
			s/side	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94

			Distance from Original Centreline (m)								Distance from Original Centreline (m)								Distance from Original Centreline (m)							
			15	20	25	30	35	40	45	50	15	20	25	30	35	40	45	50	15	20	25	30	35	40	45	50
Road Seg.	Alt. No.																									
MAIN			Sound Level Increases WITH Improvements(dBA) for 40 kph								Future Sound Level (dBA) - WITHOUT Improvements for 40 kph								Future Sound Level (dBA) - WITH IMPROVEMENTS for 40 kph							
C1	1	n/side	3.68	3.81	3.88	3.93	3.97	4.00	4.02	4.04	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	63.63	62.51	61.62	60.87	60.24	59.69	59.20	58.76
		s/side	4.79	4.63	4.54	4.48	4.44	4.41	4.39	4.37	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	64.74	63.34	62.28	61.43	60.71	60.10	59.57	59.09
	2	n/side	3.91	3.98	4.02	4.05	4.07	4.09	4.10	4.11	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	63.86	62.68	61.75	60.99	60.34	59.78	59.28	58.83
		s/side	4.52	4.43	4.39	4.35	4.33	4.32	4.30	4.29	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	64.47	63.14	62.12	61.30	60.60	60.01	59.48	59.02
	3	n/side	4.00	4.05	4.08	4.10	4.11	4.12	4.13	4.14	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	63.95	62.75	61.81	61.04	60.39	59.82	59.31	58.86
		s/side	4.41	4.35	4.32	4.30	4.29	4.28	4.27	4.26	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	64.36	63.06	62.06	61.24	60.56	59.97	59.45	58.98
C2	1	n/side	4.16	4.17	4.17	4.18	4.18	4.18	4.19	4.19	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	64.11	62.87	61.91	61.12	60.45	59.88	59.37	58.91
		s/side	4.24	4.23	4.23	4.22	4.22	4.22	4.21	4.21	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	64.20	62.94	61.96	61.16	60.49	59.91	59.40	58.94
	2	n/side	4.36	4.32	4.30	4.28	4.27	4.26	4.25	4.25	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	64.31	63.02	62.03	61.22	60.54	59.95	59.43	58.97
		s/side	4.04	4.08	4.11	4.12	4.13	4.14	4.15	4.15	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	64.00	62.78	61.84	61.06	60.40	59.83	59.33	58.88
	3	n/side	4.47	4.40	4.36	4.33	4.31	4.30	4.29	4.28	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	64.42	63.10	62.09	61.27	60.59	59.99	59.47	59.00
		s/side	3.95	4.01	4.05	4.07	4.09	4.10	4.11	4.12	59.95	58.70	57.73	56.94	56.27	55.69	55.18	54.72	63.90	62.71	61.78	61.01	60.36	59.80	59.29	58.85
D	1	n/side	3.36	3.37	3.38	3.38	3.38	3.38	3.39	3.39	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92	64.51	63.27	62.31	61.52	60.86	60.28	59.77	59.31
		s/side	3.44	3.43	3.43	3.42	3.42	3.42	3.42	3.41	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92	64.60	63.34	62.36	61.57	60.89	60.31	59.80	59.34
	2	n/side	3.56	3.52	3.50	3.48	3.47	3.46	3.45	3.45	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92	64.72	63.43	62.43	61.62	60.94	60.35	59.84	59.37
		s/side	3.24	3.28	3.31	3.32	3.33	3.34	3.35	3.35	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92	64.40	63.19	62.24	61.47	60.81	60.24	59.73	59.28
	3	n/side	3.67	3.60	3.56	3.53	3.51	3.50	3.49	3.48	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92	64.82	63.50	62.50	61.68	60.99	60.39	59.87	59.40
		s/side	3.15	3.21	3.25	3.27	3.29	3.30	3.32	3.32	61.15	59.90	58.93	58.14	57.47	56.89	56.38	55.92	64.30	63.11	62.18	61.42	60.76	60.20	59.70	59.25
MOSLEY																										
E	1	n/side	2.70	2.93	3.08	3.18	3.25	3.31	3.36	3.39	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34	63.27	62.26	61.44	60.75	60.15	59.63	59.16	58.74
		s/side	**5.07**	4.69	4.48	4.35	4.25	4.18	4.13	4.09	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34	65.65	64.02	62.84	61.91	61.15	60.50	59.93	59.43
	2	n/side	**5.94**	**5.27**	4.92	4.69	4.54	4.43	4.35	4.28	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34	66.52	64.60	63.27	62.26	61.44	60.75	60.15	59.63
		s/side	2.26	2.59	2.79	2.93	3.04	3.12	3.18	3.23	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34	62.84	61.91	61.15	60.50	59.93	59.43	58.98	58.58
	3	n/side	4.02	3.95	3.90	3.87	3.85	3.83	3.82	3.81	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34	64.60	63.27	62.26	61.44	60.75	60.15	59.63	59.16
		s/side	3.44	3.51	3.55	3.58	3.60	3.62	3.63	3.64	60.57	59.32	58.35	57.56	56.89	56.31	55.80	55.34	64.02	62.84	61.91	61.15	60.50	59.93	59.43	58.98
F	1	n/side	2.79	3.02	3.17	3.27	3.34	3.40	3.44	3.48	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19	63.20	62.19	61.37	60.68	60.08	59.56	59.09	58.67
		s/side	**5.16**	4.78	4.57	4.44	4.34	4.27	4.22	4.18	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19	65.58	63.95	62.77	61.84	61.08	60.43	59.86	59.36
	2	n/side	**6.03**	**5.36**	**5.01**	4.78	4.63	4.52	4.44	4.37	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19	66.45	64.53	63.20	62.19	61.37	60.68	60.08	59.56
		s/side	2.35	2.67	2.88	3.02	3.13	3.21	3.27	3.32	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19	62.77	61.84	61.08	60.43	59.86	59.36	58.92	58.51
	3	n/side	4.11	4.04	3.99	3.96	3.94	3.92	3.91	3.90	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19	64.53	63.20	62.19	61.37	60.68	60.08	59.56	59.09
		s/side	3.53	3.60	3.64	3.67	3.69	3.71	3.72	3.73	60.42	59.17	58.20	57.40	56.74	56.16	55.64	55.19	63.95	62.77	61.84	61.08	60.43	59.86	59.36	58.92
G	1	n/side	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
		s/side	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
	2	n/side	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
		s/side	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
	3	n/side	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
		s/side	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	59.99	58.74	57.77	56.98	56.31	55.73	55.22	54.76	64.06	62.81	61.84	61.05	60.38	59.80	59.29	58.83
H	1	n/side	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
		s/side	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
	2	n/side	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
		s/side	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
	3	n/side	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94
		s/side	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	60.26	59.01	58.04	57.25	56.58	56.00	55.49	55.03	64.17	62.92	61.95	61.16	60.49	59.91	59.40	58.94

Road Segment	Future C/L Dist for 65 dBA		Dist from original C/L (m) for future 65 dBA for 40 kph		
			Alt 1	Alt 2	Alt 3
MAIN		C/L shift*	1.90	1.05	0.70
C1	12.33	n/side	10.43	11.28	11.63
		s/side	14.23	13.38	13.03
		C/L shift*	0.15	-0.55	-0.90
C2	12.33	n/side	12.18	12.88	13.23
		s/side	12.48	11.78	11.43
		C/L shift*	0.15	-0.55	-0.90
D	13.53	n/side	13.38	14.08	14.43
		s/side	13.68	12.98	12.63
MOSLEY		C/L shift*	4.00	-6.00	-1.00
E	12.76	n/side	8.76	18.76	13.76
		s/side	16.76	6.76	11.76
		C/L shift*	4.00	-6.00	-1.00
F	12.56	n/side	8.56	18.56	13.56
		s/side	16.56	6.56	11.56
		C/L shift*	0.00	0.00	0.00
G	12.07	n/side	12.07	12.07	12.07
		s/side	12.07	12.07	12.07
		C/L shift*	0.00	0.00	0.00
H	12.38	n/side	12.38	12.38	12.38
		s/side	12.38	12.38	12.38

* Shift south is +ve, north is -ve

APPENDIX 'D'

ALTERNATIVE CENTERLINE SHIFTS

(source: Tatham Engineering)

Wasaga Beach Main Street EA

Main Street: River Road West to Stonebridge Boulevard

Wasaga Beach Main Street EA

Main Street: Stonebridge Boulevard To Beck Street

Wasaga Beach Main Street EA

Main Street: Beck Street to Main Street Bridge

Wasaga Beach Main Street EA

1: Title

Mosley Street: Willow Street to 2nd Street

Appendix M:
Benchmark Costs

Summary of Benchmark Costs

Sept 22, 2020

Street	Option	Cost per Linear Metre	Length in Metres	Total Cost
Main Street	Option 1	$ 9,500	1020	$ 9,690,000
	Option 2	$ 9,700	1020	$ 9,894,000
	Option 3	$ 10,400	1020	$ 10,608,000
Mosley Street	Option 1	$ 6,800	800	$ 5,440,000
	Option 2	$ 7,200	800	$ 5,760,000
	Option 3	$ 7,200	800	$ 5,760,000
Beach Drive	Option 1	$ 7,100	590	$ 4,189,000
	Option 2	$ 8,200	590	$ 4,838,000
	Option 3	$ 8,200	590	$ 4,838,000

Notes

1. costs do not include engineering, property or utility relocation costs

2. does not include shoreline protection ($9,000 to $12,000 per metre of shoreline assuming a concrete wall, armour stone wall or similar)

Main Street Benchmark Costs

Sept 22, 2020

Option	Cost Element	Cost per Square Metre	Width	Cost per Linear Metre
Option 1	Removals			$ 508.07
	Road Works	$ 141.90	11.5	$ 1,631.82
	Parking[1]	$ 111.40	5	$ 556.99
	Pavement Markings			$ 29.22
	Traffic Signals			$ 852.34
	Boulevard	$ 208.04	13.5	$ 2,808.54
	Decorative Parking[2]	$ 85.14	5	$ 425.68
	Soil Cell			$ 1,303.49
	Street Lights			$ 1,300.00
	Total			**$ 9,416.13**
Option 2	Removals			$ 508.07
	Road Works	$ 141.90	11	$ 1,560.87
	Parking[1]	$ 141.90	5	$ 709.49
	Pavement Markings			$ 29.22
	Traffic Signals			$ 852.34
	Boulevard	$ 208.04	14	$ 2,912.56
	Decorative Parking[2]	$ 85.14	5	$ 425.68
	Soil Cell			$ 1,340.00
	Street Lights			$ 1,300.00
	Total			**$ 9,638.21**
Option 3	Removals			$ 508.07
	Road Works	$ 141.90	11	$ 1,560.87
	Parking[1]	$ 141.90	5	$ 709.49
	Pavement Markings			$ 29.22
	Traffic Signals			$ 852.34
	Boulevard	$ 208.04	13.5	$ 2,808.54
	Decorative Parking[2]	$ 85.14	5.5	$ 468.24
	Soil Cell			$ 1,303.49
	Street Lights			$ 1,300.00
	Bollards			$ 841.23
	Total			**$ 10,381.48**

Notes

1. does not include decorative surface
2. considers decorative surface only
3. does not include engineering, utility relocation or property costs

Mosley Street Benchmark Costs

Sept 22, 2020

Option	Cost Element	Cost per Square Metre	Width	Cost per Linear Metre
Option 1	Removals			$ 508.07
	Road Works	$ 141.90	11.5	$ 1,631.82
	Pavement Markings			$ 29.22
	Traffic Signals			$ 852.34
	Boulevard	$ 208.04	11.5	$ 2,392.46
	Soil Cell			-
	Street Lights			$ 1,300.00
	Total			**$ 6,713.90**
Option 2	Removals			$ 508.07
Option 3	Road Works	$ 141.90	11	$ 1,560.87
	Pavement Markings			$ 29.22
	Traffic Signals			-
	Boulevard	$ 208.04	12	$ 2,496.48
	Soil Cell			$ 1,303.49
	Street Lights			$ 1,300.00
	Total			**$ 7,198.12**

Notes

1. does not include engineering, utility relocation or property costs

Beach Drive Benchmark Costs

Sept 22, 2020

Option	Cost Element	Cost per Square Metre	Width	Cost per Linear Metre
Option 1	Removals			$ 508.07
	Event Space[1]	$ 111.40	6	$ 668.38
	Pavement Markings			$ 29.22
	Traffic Signals			-
	Boulevard	$ 208.04	11	$ 2,288.44
	Event Space[2]	$ 85.14	6	$ 510.81
	Street Lights			$ 1,300.00
	Bollards			$ 420.62
	Boardwalk			$ 1,340.00
	Total			**$ 7,065.53**
Option 2	Removals			$ 508.07
Option 3	Event Space[1]	$ 141.90	6	$ 851.38
	Pavement Markings			$ 29.22
	Traffic Signals			-
	Boulevard	$ 208.04	11	$ 2,288.44
	Event Space[2]	$ 85.14	6	$ 510.81
	Street Lights			$ 1,300.00
	Soil Cell			$ 1,303.49
	Boardwalk			$ 1,340.00
	Total			**$ 8,131.41**

Notes

1. does not include decorative surface

2. considers decorative surface only

3. does not include engineering, utility relocation or property costs

4. does not include shoreline protection ($9,000 to $12,000 per metre of shoreline assuming a concrete wall, armour stone wall or similar)

Appendix N:
Key Intersection Operations

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	23	5	470	384	5
Future Volume (Veh/h)	12	23	5	470	384	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	25	5	511	417	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	940	420	422			
vC1, stage 1 conf vol	420					
vC2, stage 2 conf vol	521					
vCu, unblocked vol	940	420	422			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	96	100			
cM capacity (veh/h)	497	629	1127			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	38	5	511	422
Volume Left	13	5	0	0
Volume Right	25	0	0	5
cSH	577	1127	1700	1700
Volume to Capacity	0.07	0.00	0.30	0.25
Queue Length 95th (m)	1.6	0.1	0.0	0.0
Control Delay (s)	11.7	8.2	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.7	0.1		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	0	15	0	0	0	14	469	0	0	374	24
Future Volume (Veh/h)	22	0	15	0	0	0	14	469	0	0	374	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	0	16	0	0	0	15	510	0	0	407	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	960	960	420	976	973	510	433			510		
vC1, stage 1 conf vol	420	420		540	540							
vC2, stage 2 conf vol	540	540		436	433							
vCu, unblocked vol	960	960	420	976	973	510	433			510		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	97	100	100	100	99			100		
cM capacity (veh/h)	435	435	629	422	428	559	1116			1045		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	40	0	15	510	433
Volume Left	24	0	15	0	0
Volume Right	16	0	0	0	26
cSH	496	1700	1116	1700	1700
Volume to Capacity	0.08	0.00	0.01	0.30	0.25
Queue Length 95th (m)	2.0	0.0	0.3	0.0	0.0
Control Delay (s)	12.9	0.0	8.3	0.0	0.0
Lane LOS	B	A	A		
Approach Delay (s)	12.9	0.0	0.2		0.0
Approach LOS	B	A			

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	34.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	21	21	469	377	21
Future Volume (Veh/h)	28	21	21	469	377	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	23	23	510	410	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	978	422	433			
vC1, stage 1 conf vol	422					
vC2, stage 2 conf vol	556					
vCu, unblocked vol	978	422	433			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	96	98			
cM capacity (veh/h)	477	628	1116			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	53	23	510	433
Volume Left	30	23	0	0
Volume Right	23	0	0	23
cSH	533	1116	1700	1700
Volume to Capacity	0.10	0.02	0.30	0.25
Queue Length 95th (m)	2.5	0.5	0.0	0.0
Control Delay (s)	12.5	8.3	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.5	0.4		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	462	380	59	19	19
Future Volume (Veh/h)	35	462	380	59	19	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	502	413	64	21	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	477				1023	445
vC1, stage 1 conf vol					445	
vC2, stage 2 conf vol					578	
vCu, unblocked vol	477				1023	445
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				95	97
cM capacity (veh/h)	1075				458	609

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	38	502	477	42
Volume Left	38	0	0	21
Volume Right	0	0	64	21
cSH	1075	1700	1700	523
Volume to Capacity	0.04	0.30	0.28	0.08
Queue Length 95th (m)	0.8	0.0	0.0	2.0
Control Delay (s)	8.5	0.0	0.0	12.5
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	12.5
Approach LOS				B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	369	80	59	443	26	0	0	0	13	24	104
Future Volume (Veh/h)	105	369	80	59	443	26	0	0	0	13	24	104
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	401	87	64	482	28	0	0	0	14	26	113
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	510			488			1408	1310	444	1253	1340	496
vC1, stage 1 conf vol							672	672		624	624	
vC2, stage 2 conf vol							736	638		629	716	
vCu, unblocked vol	510			488			1408	1310	444	1253	1340	496
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			94			100	100	100	95	91	80
cM capacity (veh/h)	1045			1065			164	274	609	294	277	570

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	114	488	64	510	153
Volume Left	114	0	64	0	14
Volume Right	0	87	0	28	113
cSH	1045	1700	1065	1700	450
Volume to Capacity	0.11	0.29	0.06	0.30	0.34
Queue Length 95th (m)	2.8	0.0	1.5	0.0	11.3
Control Delay (s)	8.9	0.0	8.6	0.0	17.1
Lane LOS	A		A		C
Approach Delay (s)	1.7		1.0		17.1
Approach LOS					C

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	49.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	26	113	1	7	121
Future Volume (Veh/h)	3	26	113	1	7	121
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	28	123	1	8	132
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	272	124			124	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	272	124			124	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	710	922			1450	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	31	124	140
Volume Left	3	0	8
Volume Right	28	1	0
cSH	896	1700	1450
Volume to Capacity	0.03	0.07	0.01
Queue Length 95th (m)	0.8	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	361	41	66	446	14	40	17	55	11	9	10
Future Volume (Veh/h)	13	361	41	66	446	14	40	17	55	11	9	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	392	45	72	485	15	43	18	60	12	10	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	500			437			1088	1086	414	1126	1102	492
vC1, stage 1 conf vol							442	442		636	636	
vC2, stage 2 conf vol							645	644		489	465	
vCu, unblocked vol	500			437			1088	1086	414	1126	1102	492
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			88	95	91	96	97	98
cM capacity (veh/h)	1054			1112			352	370	634	322	360	572

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	14	437	72	500	121	33
Volume Left	14	0	72	0	43	12
Volume Right	0	45	0	15	60	11
cSH	1054	1700	1112	1700	456	392
Volume to Capacity	0.01	0.26	0.06	0.29	0.27	0.08
Queue Length 95th (m)	0.3	0.0	1.6	0.0	8.0	2.1
Control Delay (s)	8.5	0.0	8.5	0.0	15.7	15.0
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		1.1		15.7	15.0
Approach LOS					C	C

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	46.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	275	36	24	366	47	23	144	4	44	77	88
Future Volume (vph)	110	275	36	24	366	47	23	144	4	44	77	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	1815		1755	1816		1755	1840		1755	1699	
Flt Permitted	0.48	1.00		0.56	1.00		0.61	1.00		0.66	1.00	
Satd. Flow (perm)	890	1815		1029	1816		1124	1840		1210	1699	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	299	39	26	398	51	25	157	4	48	84	96
RTOR Reduction (vph)	0	5	0	0	5	0	0	2	0	0	80	0
Lane Group Flow (vph)	120	333	0	26	444	0	25	159	0	48	100	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.0	32.0		32.0	32.0		8.1	8.1		8.1	8.1	
Effective Green, g (s)	32.0	32.0		32.0	32.0		8.1	8.1		8.1	8.1	
Actuated g/C Ratio	0.67	0.67		0.67	0.67		0.17	0.17		0.17	0.17	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	592	1207		684	1208		189	309		203	286	
v/s Ratio Prot		0.18			c0.24			c0.09			0.06	
v/s Ratio Perm	0.13			0.03			0.02			0.04		
v/c Ratio	0.20	0.28		0.04	0.37		0.13	0.52		0.24	0.35	
Uniform Delay, d1	3.1	3.3		2.8	3.6		17.0	18.2		17.3	17.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.6		0.1	0.9		0.3	1.5		0.6	0.7	
Delay (s)	3.9	3.9		2.9	4.4		17.3	19.7		17.9	18.4	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		3.9			4.3			19.4			18.3	
Approach LOS		A			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	48.1	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	22	32	22	15	17	27	393	32	13	366	325
Future Volume (vph)	298	22	32	22	15	17	27	393	32	13	366	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.91		1.00	0.92			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)	1755	1683		1755	1701			3462			3504	1570
Flt Permitted	0.59	1.00		0.72	1.00			0.91			0.93	1.00
Satd. Flow (perm)	1097	1683		1327	1701			3171			3274	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	324	24	35	24	16	18	29	427	35	14	398	353
RTOR Reduction (vph)	0	16	0	0	12	0	0	9	0	0	0	247
Lane Group Flow (vph)	324	43	0	24	22	0	0	482	0	0	412	106
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	32.9	32.9		18.9	18.9			18.1			18.1	18.1
Effective Green, g (s)	32.9	32.9		18.9	18.9			18.1			18.1	18.1
Actuated g/C Ratio	0.55	0.55		0.31	0.31			0.30			0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	705	922		418	535			956			987	473
v/s Ratio Prot	c0.07	0.03			0.01							
v/s Ratio Perm	c0.18			0.02				c0.15			0.13	0.07
v/c Ratio	0.46	0.05		0.06	0.04			0.50			0.42	0.23
Uniform Delay, d1	7.7	6.3		14.3	14.3			17.3			16.7	15.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.5	0.1		0.3	0.1			1.9			1.3	1.1
Delay (s)	8.2	6.4		14.6	14.4			19.2			18.0	16.8
Level of Service	A	A		B	B			B			B	B
Approach Delay (s)		7.9			14.5			19.2			17.5	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	28	10	612	516	10
Future Volume (Veh/h)	16	28	10	612	516	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	30	11	665	561	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1254	566	572			
vC1, stage 1 conf vol	566					
vC2, stage 2 conf vol	687					
vCu, unblocked vol	1254	566	572			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	94	99			
cM capacity (veh/h)	400	520	991			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	47	11	665	572
Volume Left	17	11	0	0
Volume Right	30	0	0	11
cSH	469	991	1700	1700
Volume to Capacity	0.10	0.01	0.39	0.34
Queue Length 95th (m)	2.5	0.3	0.0	0.0
Control Delay (s)	13.5	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.5	0.1		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	0	24	0	0	0	24	604	0	0	503	35
Future Volume (Veh/h)	31	0	24	0	0	0	24	604	0	0	503	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	0	26	0	0	0	26	657	0	0	547	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1275	1275	566	1301	1294	657	585			657		
vC1, stage 1 conf vol	566	566		709	709							
vC2, stage 2 conf vol	709	709		592	585							
vCu, unblocked vol	1275	1275	566	1301	1294	657	585			657		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	100	95	100	100	100	97			100		
cM capacity (veh/h)	337	349	520	317	339	461	980			921		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	60	0	26	657	585
Volume Left	34	0	26	0	0
Volume Right	26	0	0	0	38
cSH	398	1700	980	1700	1700
Volume to Capacity	0.15	0.00	0.03	0.39	0.34
Queue Length 95th (m)	4.0	0.0	0.6	0.0	0.0
Control Delay (s)	15.6	0.0	8.8	0.0	0.0
Lane LOS	C	A	A		
Approach Delay (s)	15.6	0.0	0.3		0.0
Approach LOS	C	A			

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	41.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	40	43	592	497	43
Future Volume (Veh/h)	47	40	43	592	497	43
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	43	47	643	540	47
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1300	564	587			
vC1, stage 1 conf vol	564					
vC2, stage 2 conf vol	737					
vCu, unblocked vol	1300	564	587			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	92	95			
cM capacity (veh/h)	375	522	978			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	94	47	643	587
Volume Left	51	47	0	0
Volume Right	43	0	0	47
cSH	431	978	1700	1700
Volume to Capacity	0.22	0.05	0.38	0.35
Queue Length 95th (m)	6.2	1.1	0.0	0.0
Control Delay (s)	15.7	8.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.7	0.6		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	54	584	503	79	37	37
Future Volume (Veh/h)	54	584	503	79	37	37
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	635	547	86	40	40
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	633				1343	590
vC1, stage 1 conf vol					590	
vC2, stage 2 conf vol					753	
vCu, unblocked vol	633				1343	590
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				89	92
cM capacity (veh/h)	940				362	504

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	59	635	633	80
Volume Left	59	0	0	40
Volume Right	0	0	86	40
cSH	940	1700	1700	421
Volume to Capacity	0.06	0.37	0.37	0.19
Queue Length 95th (m)	1.5	0.0	0.0	5.3
Control Delay (s)	9.1	0.0	0.0	15.5
Lane LOS	A			C
Approach Delay (s)	0.8		0.0	15.5
Approach LOS				C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	493	89	72	580	37	0	0	0	22	25	112
Future Volume (Veh/h)	115	493	89	72	580	37	0	0	0	22	25	112
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	125	536	97	78	630	40	0	0	0	24	27	122
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	670			633			1756	1660	584	1592	1689	650
vC1, stage 1 conf vol							834	834		806	806	
vC2, stage 2 conf vol							922	826		786	883	
vCu, unblocked vol	670			633			1756	1660	584	1592	1689	650
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			92			100	100	100	89	87	74
cM capacity (veh/h)	911			940			74	195	507	209	202	466

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	125	633	78	670	173
Volume Left	125	0	78	0	24
Volume Right	0	97	0	40	122
cSH	911	1700	940	1700	339
Volume to Capacity	0.14	0.37	0.08	0.39	0.51
Queue Length 95th (m)	3.6	0.0	2.1	0.0	21.0
Control Delay (s)	9.6	0.0	9.2	0.0	26.2
Lane LOS	A		A		D
Approach Delay (s)	1.6		1.0		26.2
Approach LOS					D

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	58.6%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	27	116	1	8	124
Future Volume (Veh/h)	3	27	116	1	8	124
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	29	126	1	9	135
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	280	126			127	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	280	126			127	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	702	918			1447	

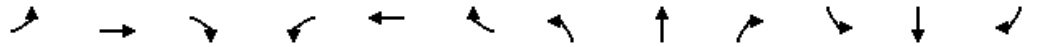
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	127	144
Volume Left	3	0	9
Volume Right	29	1	0
cSH	893	1700	1447
Volume to Capacity	0.04	0.07	0.01
Queue Length 95th (m)	0.8	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	474	71	106	566	22	66	17	88	19	10	16
Future Volume (Veh/h)	19	474	71	106	566	22	66	17	88	19	10	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	515	77	115	615	24	72	18	96	21	11	17
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)					401							
pX, platoon unblocked												
vC, conflicting volume	639			592			1463	1464	554	1519	1491	627
vC1, stage 1 conf vol							596	596		857	857	
vC2, stage 2 conf vol							868	869		662	634	
vCu, unblocked vol	639			592			1463	1464	554	1519	1491	627
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			88			69	93	82	89	96	96
cM capacity (veh/h)	935			974			235	266	528	190	253	480

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	21	592	115	639	186	49
Volume Left	21	0	115	0	72	21
Volume Right	0	77	0	24	96	17
cSH	935	1700	974	1700	335	259
Volume to Capacity	0.02	0.35	0.12	0.38	0.56	0.19
Queue Length 95th (m)	0.5	0.0	3.0	0.0	24.3	5.2
Control Delay (s)	8.9	0.0	9.2	0.0	28.4	22.1
Lane LOS	A		A		D	C
Approach Delay (s)	0.3		1.4		28.4	22.1
Approach LOS					D	C

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	57.5%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	404	43	25	513	57	32	154	4	53	85	104
Future Volume (vph)	129	404	43	25	513	57	32	154	4	53	85	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	1820		1755	1820		1755	1841		1755	1694	
Flt Permitted	0.36	1.00		0.45	1.00		0.54	1.00		0.62	1.00	
Satd. Flow (perm)	667	1820		829	1820		997	1841		1147	1694	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	439	47	27	558	62	35	167	4	58	92	113
RTOR Reduction (vph)	0	5	0	0	5	0	0	2	0	0	90	0
Lane Group Flow (vph)	140	481	0	27	615	0	35	169	0	58	115	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	34.2	34.2		34.2	34.2		10.0	10.0		10.0	10.0	
Effective Green, g (s)	34.2	34.2		34.2	34.2		10.0	10.0		10.0	10.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66		0.19	0.19		0.19	0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	437	1192		543	1192		190	352		219	324	
v/s Ratio Prot		0.26			c0.34			c0.09			0.07	
v/s Ratio Perm	0.21			0.03			0.04			0.05		
v/c Ratio	0.32	0.40		0.05	0.52		0.18	0.48		0.26	0.36	
Uniform Delay, d1	3.9	4.2		3.2	4.7		17.7	18.8		18.0	18.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.0		0.2	1.6		0.5	1.0		0.7	0.7	
Delay (s)	5.9	5.2		3.4	6.3		18.2	19.8		18.6	19.0	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		5.4			6.2			19.5			18.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	52.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	423	23	46	23	15	17	42	405	33	13	377	466
Future Volume (vph)	423	23	46	23	15	17	42	405	33	13	377	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.90		1.00	0.92			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	1.00
Satd. Flow (prot)	1755	1662		1755	1701			3458			3504	1570
Flt Permitted	0.59	1.00		0.71	1.00			0.88			0.93	1.00
Satd. Flow (perm)	1097	1662		1308	1701			3068			3272	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	460	25	50	25	16	18	46	440	36	14	410	507
RTOR Reduction (vph)	0	23	0	0	12	0	0	9	0	0	0	354
Lane Group Flow (vph)	460	52	0	25	22	0	0	513	0	0	424	153
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	32.9	32.9		18.9	18.9			18.1			18.1	18.1
Effective Green, g (s)	32.9	32.9		18.9	18.9			18.1			18.1	18.1
Actuated g/C Ratio	0.55	0.55		0.31	0.31			0.30			0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	705	911		412	535			925			987	473
v/s Ratio Prot	c0.10	0.03			0.01							
v/s Ratio Perm	c0.25			0.02				c0.17			0.13	0.10
v/c Ratio	0.65	0.06		0.06	0.04			0.55			0.43	0.32
Uniform Delay, d1	8.6	6.3		14.4	14.3			17.6			16.8	16.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.2	0.1		0.3	0.1			2.4			1.4	1.8
Delay (s)	10.8	6.4		14.6	14.4			20.0			18.2	18.0
Level of Service	B	A		B	B			B			B	B
Approach Delay (s)		10.2			14.5			20.0			18.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	24	36	19	895	782	19
Future Volume (Veh/h)	24	36	19	895	782	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	39	21	973	850	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1876	860	871			
vC1, stage 1 conf vol	860					
vC2, stage 2 conf vol	1015					
vCu, unblocked vol	1876	860	871			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	89	97			
cM capacity (veh/h)	264	352	766			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	65	21	973	871
Volume Left	26	21	0	0
Volume Right	39	0	0	21
cSH	311	766	1700	1700
Volume to Capacity	0.21	0.03	0.57	0.51
Queue Length 95th (m)	5.9	0.6	0.0	0.0
Control Delay (s)	19.6	9.8	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.6	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	0	41	0	0	0	44	875	0	0	760	56
Future Volume (Veh/h)	48	0	41	0	0	0	44	875	0	0	760	56
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	0	45	0	0	0	48	951	0	0	826	61
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1904	1904	856	1948	1934	951	887			951		
vC1, stage 1 conf vol	856	856		1047	1047							
vC2, stage 2 conf vol	1047	1047		902	887							
vCu, unblocked vol	1904	1904	856	1948	1934	951	887			951		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	100	87	100	100	100	94			100		
cM capacity (veh/h)	206	227	354	174	213	312	755			714		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	97	0	48	951	887
Volume Left	52	0	48	0	0
Volume Right	45	0	0	0	61
cSH	255	1700	755	1700	1700
Volume to Capacity	0.38	0.00	0.06	0.56	0.52
Queue Length 95th (m)	12.9	0.0	1.5	0.0	0.0
Control Delay (s)	27.5	0.0	10.1	0.0	0.0
Lane LOS	D	A	B		
Approach Delay (s)	27.5	0.0	0.5		0.0
Approach LOS	D	A			

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	57.9%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	85	78	86	837	738	86
Future Volume (Veh/h)	85	78	86	837	738	86
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	85	93	910	802	93
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1944	848	895			
vC1, stage 1 conf vol	848					
vC2, stage 2 conf vol	1096					
vCu, unblocked vol	1944	848	895			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	60	76	88			
cM capacity (veh/h)	232	358	750			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	177	93	910	895
Volume Left	92	93	0	0
Volume Right	85	0	0	93
cSH	279	750	1700	1700
Volume to Capacity	0.63	0.12	0.54	0.53
Queue Length 95th (m)	30.2	3.2	0.0	0.0
Control Delay (s)	37.9	10.5	0.0	0.0
Lane LOS	E	B		
Approach Delay (s)	37.9	1.0		0.0
Approach LOS	E			

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	93	828	749	120	74	74
Future Volume (Veh/h)	93	828	749	120	74	74
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	101	900	814	130	80	80
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	944				1981	879
vC1, stage 1 conf vol					879	
vC2, stage 2 conf vol					1102	
vCu, unblocked vol	944				1981	879
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	86				64	77
cM capacity (veh/h)	719				225	344

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	101	900	944	160
Volume Left	101	0	0	80
Volume Right	0	0	130	80
cSH	719	1700	1700	272
Volume to Capacity	0.14	0.53	0.56	0.59
Queue Length 95th (m)	3.7	0.0	0.0	26.2
Control Delay (s)	10.8	0.0	0.0	35.6
Lane LOS	B			E
Approach Delay (s)	1.1		0.0	35.6
Approach LOS				E

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	741	108	98	854	58	0	0	0	41	26	130
Future Volume (Veh/h)	134	741	108	98	854	58	0	0	0	41	26	130
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	146	805	117	107	928	63	0	0	0	45	28	141
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	991			922			2452	2360	864	2270	2388	960
vC1, stage 1 conf vol							1156	1156		1174	1174	
vC2, stage 2 conf vol							1297	1205		1097	1214	
vCu, unblocked vol	991			922			2452	2360	864	2270	2388	960
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	79			85			100	100	100	47	67	54
cM capacity (veh/h)	690			732			6	67	351	85	84	309

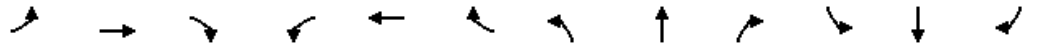
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	146	922	107	991	214
Volume Left	146	0	107	0	45
Volume Right	0	117	0	63	141
cSH	690	1700	732	1700	162
Volume to Capacity	0.21	0.54	0.15	0.58	1.32
Queue Length 95th (m)	6.1	0.0	3.9	0.0	97.1
Control Delay (s)	11.6	0.0	10.8	0.0	235.0
Lane LOS	B		B		F
Approach Delay (s)	1.6		1.0		235.0
Approach LOS					F

Intersection Summary				
Average Delay	22.3			
Intersection Capacity Utilization	77.5%	ICU Level of Service		D
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	28	122	1	8	131
Future Volume (Veh/h)	3	28	122	1	8	131
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	30	133	1	9	142
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	294	134			134	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	294	134			134	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	689	910			1438	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	33	134	151
Volume Left	3	0	9
Volume Right	30	1	0
cSH	884	1700	1438
Volume to Capacity	0.04	0.08	0.01
Queue Length 95th (m)	0.9	0.0	0.1
Control Delay (s)	9.2	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	699	130	186	807	40	116	18	153	34	10	27
Future Volume (Veh/h)	30	699	130	186	807	40	116	18	153	34	10	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	760	141	202	877	43	126	20	166	37	11	29
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)					401							
pX, platoon unblocked	0.76						0.76	0.76		0.76	0.76	0.76
vC, conflicting volume	920			901			2212	2220	830	2304	2270	898
vC1, stage 1 conf vol							896	896		1302	1302	
vC2, stage 2 conf vol							1316	1324		1002	967	
vCu, unblocked vol	734			901			2440	2451	830	2562	2516	706
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			73			0	78	55	0	87	91
cM capacity (veh/h)	653			746			60	92	367	5	84	328

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	901	202	920	312	77
Volume Left	33	0	202	0	126	37
Volume Right	0	141	0	43	166	29
cSH	653	1700	746	1700	113	9
Volume to Capacity	0.05	0.53	0.27	0.54	2.76	8.26
Queue Length 95th (m)	1.2	0.0	8.3	0.0	219.7	Err
Control Delay (s)	10.8	0.0	11.6	0.0	874.6	Err
Lane LOS	B		B		F	F
Approach Delay (s)	0.4		2.1		874.6	Err
Approach LOS					F	F

Intersection Summary				
Average Delay	427.6			
Intersection Capacity Utilization	84.9%	ICU Level of Service		E
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	662	58	26	806	77	48	174	5	73	101	135
Future Volume (vph)	165	662	58	26	806	77	48	174	5	73	101	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	1825		1755	1823		1755	1840		1755	1689	
Flt Permitted	0.19	1.00		0.28	1.00		0.32	1.00		0.47	1.00	
Satd. Flow (perm)	357	1825		523	1823		592	1840		875	1689	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	720	63	28	876	84	52	189	5	79	110	147
RTOR Reduction (vph)	0	3	0	0	4	0	0	2	0	0	65	0
Lane Group Flow (vph)	179	780	0	28	956	0	52	192	0	79	192	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	53.2	53.2		53.2	53.2		13.3	13.3		13.3	13.3	
Effective Green, g (s)	53.2	53.2		53.2	53.2		13.3	13.3		13.3	13.3	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	254	1303		373	1301		105	328		156	301	
v/s Ratio Prot		0.43			c0.52			0.10			c0.11	
v/s Ratio Perm	0.50			0.05			0.09			0.09		
v/c Ratio	0.70	0.60		0.08	0.74		0.50	0.59		0.51	0.64	
Uniform Delay, d1	6.1	5.3		3.2	6.4		27.6	28.1		27.6	28.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	2.0		0.4	3.7		3.6	2.7		2.6	4.4	
Delay (s)	21.3	7.4		3.6	10.1		31.2	30.7		30.2	32.8	
Level of Service	C	A		A	B		C	C		C	C	
Approach Delay (s)		9.9			9.9			30.8			32.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	674	24	73	24	16	18	72	429	35	14	400	748
Future Volume (vph)	674	24	73	24	16	18	72	429	35	14	400	748
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	1.00
Frt	1.00	0.89		1.00	0.92			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	1.00
Satd. Flow (prot)	1755	1639		1755	1697			3452			3504	1570
Flt Permitted	0.60	1.00		0.69	1.00			0.78			0.93	1.00
Satd. Flow (perm)	1110	1639		1273	1697			2694			3256	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	733	26	79	26	17	20	78	466	38	15	435	813
RTOR Reduction (vph)	0	31	0	0	14	0	0	7	0	0	0	598
Lane Group Flow (vph)	733	74	0	26	23	0	0	575	0	0	450	215
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			4			8	
Permitted Phases	6			2			4			8		8
Actuated Green, G (s)	42.5	42.5		20.5	20.5			18.5			18.5	18.5
Effective Green, g (s)	42.5	42.5		20.5	20.5			18.5			18.5	18.5
Actuated g/C Ratio	0.61	0.61		0.29	0.29			0.26			0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	835	995		372	496			711			860	414
v/s Ratio Prot	c0.22	0.05			0.01							
v/s Ratio Perm	c0.31			0.02				c0.21			0.14	0.14
v/c Ratio	0.88	0.07		0.07	0.05			0.81			0.52	0.52
Uniform Delay, d1	10.1	5.7		17.9	17.7			24.1			22.0	22.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	10.3	0.1		0.4	0.2			9.6			2.3	4.6
Delay (s)	20.4	5.8		18.2	17.9			33.7			24.3	26.5
Level of Service	C	A		B	B			C			C	C
Approach Delay (s)		18.6			18.0			33.7			25.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	24	36	19	895	782	19
Future Volume (vph)	24	36	19	895	782	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1664		1755	1847	1841	
Flt Permitted	0.98		0.29	1.00	1.00	
Satd. Flow (perm)	1664		527	1847	1841	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	39	21	973	850	21
RTOR Reduction (vph)	36	0	0	0	1	0
Lane Group Flow (vph)	29	0	21	973	870	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	4.5		50.9	50.9	50.9	
Effective Green, g (s)	4.5		50.9	50.9	50.9	
Actuated g/C Ratio	0.07		0.79	0.79	0.79	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	116		416	1459	1455	
v/s Ratio Prot	c0.02			c0.53	0.47	
v/s Ratio Perm			0.04			
v/c Ratio	0.25		0.05	0.67	0.60	
Uniform Delay, d1	28.3		1.5	3.0	2.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.1		0.2	2.4	1.8	
Delay (s)	29.5		1.7	5.4	4.5	
Level of Service	C		A	A	A	
Approach Delay (s)	29.5			5.3	4.5	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	64.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	85	78	86	837	738	86
Future Volume (vph)	85	78	86	837	738	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.94		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1684		1755	1847	1821	
Flt Permitted	0.97		0.23	1.00	1.00	
Satd. Flow (perm)	1684		421	1847	1821	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	85	93	910	802	93
RTOR Reduction (vph)	68	0	0	0	5	0
Lane Group Flow (vph)	109	0	93	910	890	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	7.6		37.8	37.8	37.8	
Effective Green, g (s)	7.6		37.8	37.8	37.8	
Actuated g/C Ratio	0.14		0.69	0.69	0.69	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	235		292	1283	1265	
v/s Ratio Prot	c0.06			c0.49	0.49	
v/s Ratio Perm			0.22			
v/c Ratio	0.46		0.32	0.71	0.70	
Uniform Delay, d1	21.5		3.3	5.0	5.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.4		2.9	3.3	3.3	
Delay (s)	23.0		6.1	8.3	8.3	
Level of Service	C		A	A	A	
Approach Delay (s)	23.0			8.1	8.3	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	93	828	749	120	74	74
Future Volume (vph)	93	828	749	120	74	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.98		0.93	
Flt Protected	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1755	1847	1813		1681	
Flt Permitted	0.22	1.00	1.00		0.98	
Satd. Flow (perm)	402	1847	1813		1681	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	900	814	130	80	80
RTOR Reduction (vph)	0	0	6	0	67	0
Lane Group Flow (vph)	101	900	938	0	93	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases	2					
Actuated Green, G (s)	43.5	43.5	43.5		7.5	
Effective Green, g (s)	43.5	43.5	43.5		7.5	
Actuated g/C Ratio	0.72	0.72	0.72		0.12	
Clearance Time (s)	4.5	4.5	4.5		4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	291	1339	1314		210	
v/s Ratio Prot		0.49	c0.52		c0.06	
v/s Ratio Perm	0.25					
v/c Ratio	0.35	0.67	0.71		0.44	
Uniform Delay, d1	3.0	4.4	4.7		24.3	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	3.3	2.7	3.3		1.5	
Delay (s)	6.3	7.1	8.0		25.8	
Level of Service	A	A	A		C	
Approach Delay (s)		7.0	8.0		25.8	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	699	130	186	807	40	116	18	153	34	10	27
Future Volume (vph)	30	699	130	186	807	40	116	18	153	34	10	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		2.0	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	1804		1755	1834		1755	1600		1755	1646	
Flt Permitted	0.26	1.00		0.10	1.00		0.73	1.00		0.53	1.00	
Satd. Flow (perm)	480	1804		186	1834		1350	1600		983	1646	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	760	141	202	877	43	126	20	166	37	11	29
RTOR Reduction (vph)	0	8	0	0	2	0	0	137	0	0	24	0
Lane Group Flow (vph)	33	893	0	202	918	0	126	49	0	37	16	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	37.7	37.7		47.5	47.5		11.9	11.9		11.9	11.9	
Effective Green, g (s)	37.7	37.7		47.5	47.5		11.9	11.9		11.9	11.9	
Actuated g/C Ratio	0.55	0.55		0.69	0.69		0.17	0.17		0.17	0.17	
Clearance Time (s)	4.5	4.5		2.0	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	264	994		308	1273		234	278		171	286	
v/s Ratio Prot		c0.50		0.07	c0.50			0.03			0.01	
v/s Ratio Perm	0.07			0.38			c0.09			0.04		
v/c Ratio	0.12	0.90		0.66	0.72		0.54	0.18		0.22	0.06	
Uniform Delay, d1	7.4	13.6		13.2	6.4		25.7	24.1		24.2	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	10.7		5.0	2.0		2.4	0.3		0.6	0.1	
Delay (s)	7.6	24.3		18.1	8.4		28.1	24.4		24.9	23.6	
Level of Service	A	C		B	A		C	C		C	C	
Approach Delay (s)		23.7			10.2			25.9			24.2	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	68.4	Sum of lost time (s)	11.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Junctions 9

ARCADY 9 - Roundabout Module

Filename: RRW & Main.j9
Path: C:\Users\DPerks\Desktop\Wasaga Beach EA\Design\ARCADY
Report generation date: 8/31/2020 9:48:20 AM

Summary of intersection performance

	PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	River Road West & Main - 2041							
1 - River Road West	2.1	4.8	6.15	0.69	A	7.52	A	22 % [2 - Main Street]
2 - Main Street	2.7	10.2	11.60	0.74	B			
3 - River Road West	0.7	1.5	4.47	0.42	A			
4 - Ansley Road	0.2	0.5	9.00	0.14	A			

There are warnings associated with this model run - see the 'Data Errors and Warnings' tables.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	8/17/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	B-9GJ6XZ1\DPerks
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
✓	✓	Delay	0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	River Road West & Main	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2041	PM	PHF	17:00	18:00	15

River Road West & Main - 2041, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	River Road West & Main	Standard Roundabout		1, 2, 3, 4	7.52	A

Intersection Network Options

Driving side	Lighting	Network residual capacity (%)	First leg reaching threshold
Right	Normal/unknown	22	2 - Main Street

Legs

Legs

Leg	Name	Description
1	River Road West	
2	Main Street	
3	River Road West	
4	Ansley Road	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - River Road West	3.50	7.00	30.0	20.0	40.0	15.0	
2 - Main Street	2.50	5.00	30.0	20.0	40.0	15.0	
3 - River Road West	3.50	7.00	30.0	20.0	40.0	15.0	
4 - Ansley Road	2.00	4.00	30.0	20.0	40.0	15.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1 - River Road West	0.703	1928
2 - Main Street	0.603	1426
3 - River Road West	0.703	1928
4 - Ansley Road	0.550	1163

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - River Road West		✓	1162	100.000
2 - Main Street		✓	771	100.000
3 - River Road West		✓	536	100.000
4 - Ansley Road		✓	58	100.000

Peak Hour Factor Data (Traffic)

Leg	Hourly volume (Veh/hr)	Peak hour factor	Peak time segment
1 - River Road West	1162	0.92	SecondQuarter
2 - Main Street	771	0.92	SecondQuarter
3 - River Road West	536	0.92	SecondQuarter
4 - Ansley Road	58	0.92	SecondQuarter

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - River Road West	**2 - Main Street**	**3 - River Road West**	**4 - Ansley Road**
From	**1 - River Road West**	0	748	400	14
	2 - Main Street	674	0	73	24
	3 - River Road West	429	72	0	35
	4 - Ansley Road	18	16	24	0

Vehicle Mix

Truck Percentages

		To			
		1 - River Road West	**2 - Main Street**	**3 - River Road West**	**4 - Ansley Road**
From	**1 - River Road West**	0	0	0	0
	2 - Main Street	0	0	0	0
	3 - River Road West	0	0	0	0
	4 - Ansley Road	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS
1 - River Road West	0.69	6.15	2.1	4.8	A
2 - Main Street	0.74	11.60	2.7	10.2	B
3 - River Road West	0.42	4.47	0.7	1.5	A
4 - Ansley Road	0.14	9.00	0.2	0.5	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - River Road West	1095	105	1854	0.590	1089	1.4	4.669	A
2 - Main Street	726	410	1179	0.616	720	1.6	7.748	A
3 - River Road West	505	665	1461	0.346	503	0.5	3.751	A
4 - Ansley Road	55	1099	558	0.098	54	0.1	7.142	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - River Road West	1263	122	1843	0.685	1260	2.1	6.149	A
2 - Main Street	838	475	1140	0.735	834	2.7	11.596	B
3 - River Road West	583	770	1387	0.420	582	0.7	4.469	A
4 - Ansley Road	63	1273	462	0.136	63	0.2	9.003	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - River Road West	1196	115	1847	0.647	1197	1.9	5.546	A
2 - Main Street	793	451	1154	0.687	795	2.3	10.074	B
3 - River Road West	552	734	1412	0.391	552	0.6	4.188	A
4 - Ansley Road	60	1211	497	0.120	60	0.1	8.242	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - River Road West	1095	106	1854	0.590	1096	1.5	4.764	A
2 - Main Street	726	413	1177	0.617	729	1.6	8.078	A
3 - River Road West	505	673	1455	0.347	505	0.5	3.792	A
4 - Ansley Road	55	1109	552	0.099	55	0.1	7.236	A

Queue Variation Results for each time segment

17:00 - 17:15

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - River Road West	1.42	0.06	0.79	3.29	4.77			N/A	N/A
2 - Main Street	1.57	0.07	0.97	3.56	4.97			N/A	N/A
3 - River Road West	0.53	0.53	1.00	1.40	1.45			N/A	N/A
4 - Ansley Road	0.11	0.00	0.00	0.11	0.11			N/A	N/A

17:15 - 17:30

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - River Road West	2.13	0.03	0.27	2.13	2.13			N/A	N/A
2 - Main Street	2.66	0.03	0.29	2.66	10.20			N/A	N/A
3 - River Road West	0.72	0.03	0.25	0.72	0.72			N/A	N/A
4 - Ansley Road	0.16	0.03	0.26	0.47	0.49			N/A	N/A

17:30 - 17:45

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - River Road West	1.86	0.03	0.26	1.86	1.86			N/A	N/A
2 - Main Street	2.27	0.03	0.27	2.27	2.27			N/A	N/A
3 - River Road West	0.65	0.03	0.27	0.65	1.53			N/A	N/A
4 - Ansley Road	0.14	0.03	0.25	0.45	0.48			N/A	N/A

17:45 - 18:00

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - River Road West	1.46	0.10	1.16	2.76	3.64			N/A	N/A
2 - Main Street	1.65	0.05	0.67	4.11	6.22			N/A	N/A
3 - River Road West	0.53	0.53	1.00	1.40	1.45			N/A	N/A
4 - Ansley Road	0.11	0.00	0.00	0.11	0.11			N/A	N/A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.1.7462

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: Stonebridge & Main.j9
Path: C:\Users\DPerks\Desktop\Wasaga Beach EA\Design\ARCADY
Report generation date: 8/31/2020 9:47:15 AM

Summary of intersection performance

	PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Stonebridge & Main - 2041							
1 - Main Street	4.8	26.0	17.60	0.84	C	13.33	B	11 % [1 - Main Street]
2 - Stonebridge Blvd	1.1	1.5	11.66	0.52	B			
3 - Main Street	2.8	9.9	10.51	0.74	B			
4 - Stonebridge Blvd	0.6	2.1	9.43	0.39	A			

There are warnings associated with this model run - see the 'Data Errors and Warnings' tables.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	8/17/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	B-9GJ6XZ1\DPerks
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
✓	✓	Delay	0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Stonebridge & Main	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2041	PM	PHF	17:00	18:00	15

Stonebridge & Main - 2041, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	Stonebridge & Main	Standard Roundabout		1, 2, 3, 4	13.33	B

Intersection Network Options

Driving side	Lighting	Network residual capacity (%)	First leg reaching threshold
Right	Normal/unknown	11	1 - Main Street

Legs

Legs

Leg	Name	Description
1	Main Street	
2	Stonebridge Blvd	
3	Main Street	
4	Stonebridge Blvd	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Main Street	2.50	5.00	30.0	20.0	40.0	15.0	
2 - Stonebridge Blvd	2.00	4.00	30.0	20.0	40.0	15.0	
3 - Main Street	2.50	5.00	30.0	20.0	40.0	15.0	
4 - Stonebridge Blvd	2.00	4.00	30.0	20.0	40.0	15.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1 - Main Street	0.603	1426
2 - Stonebridge Blvd	0.550	1163
3 - Main Street	0.603	1426
4 - Stonebridge Blvd	0.550	1163

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Main Street		✓	909	100.000
2 - Stonebridge Blvd		✓	309	100.000
3 - Main Street		✓	885	100.000
4 - Stonebridge Blvd		✓	227	100.000

Peak Hour Factor Data (Traffic)

Leg	Hourly volume (Veh/hr)	Peak hour factor	Peak time segment
1 - Main Street	909	0.92	SecondQuarter
2 - Stonebridge Blvd	309	0.92	SecondQuarter
3 - Main Street	885	0.92	SecondQuarter
4 - Stonebridge Blvd	227	0.92	SecondQuarter

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Main Street	2 - Stonebridge Blvd	3 - Main Street	4 - Stonebridge Blvd
From	1 - Main Street	0	77	806	26
	2 - Stonebridge Blvd	73	0	135	101
	3 - Main Street	662	165	0	58
	4 - Stonebridge Blvd	5	174	48	0

Vehicle Mix

Truck Percentages

		To			
		1 - Main Street	2 - Stonebridge Blvd	3 - Main Street	4 - Stonebridge Blvd
From	1 - Main Street	0	0	0	0
	2 - Stonebridge Blvd	0	0	0	0
	3 - Main Street	0	0	0	0
	4 - Stonebridge Blvd	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS
1 - Main Street	0.84	17.60	4.8	26.0	C
2 - Stonebridge Blvd	0.52	11.66	1.1	1.5	B
3 - Main Street	0.74	10.51	2.8	9.9	B
4 - Stonebridge Blvd	0.39	9.43	0.6	2.1	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Main Street	856	362	1208	0.709	847	2.3	9.734	A
2 - Stonebridge Blvd	291	820	712	0.409	288	0.7	8.453	A
3 - Main Street	834	187	1314	0.635	827	1.7	7.298	A
4 - Stonebridge Blvd	214	841	700	0.305	212	0.4	7.353	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Main Street	988	419	1173	0.842	978	4.8	17.604	C
2 - Stonebridge Blvd	336	947	641	0.524	334	1.1	11.659	B
3 - Main Street	962	216	1296	0.742	958	2.8	10.514	B
4 - Stonebridge Blvd	247	974	627	0.394	246	0.6	9.428	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Main Street	935	399	1186	0.789	939	4.0	14.804	B
2 - Stonebridge Blvd	318	909	663	0.480	318	0.9	10.472	B
3 - Main Street	911	206	1302	0.700	912	2.4	9.283	A
4 - Stonebridge Blvd	234	928	652	0.358	234	0.6	8.609	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Main Street	856	365	1206	0.710	862	2.5	10.641	B
2 - Stonebridge Blvd	291	834	704	0.414	292	0.7	8.761	A
3 - Main Street	834	189	1312	0.635	836	1.8	7.606	A
4 - Stonebridge Blvd	214	850	695	0.308	214	0.4	7.499	A

Queue Variation Results for each time segment

17:00 - 17:15

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Main Street	2.35	0.06	0.98	6.04	9.03			N/A	N/A
2 - Stonebridge Blvd	0.68	0.16	0.91	1.38	1.44			N/A	N/A
3 - Main Street	1.70	0.07	0.95	3.97	5.76			N/A	N/A
4 - Stonebridge Blvd	0.43	0.00	0.00	0.43	0.43			N/A	N/A

17:15 - 17:30

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Main Street	4.77	0.04	0.35	10.61	25.99			N/A	N/A
2 - Stonebridge Blvd	1.07	0.03	0.26	1.07	1.07			N/A	N/A
3 - Main Street	2.76	0.03	0.29	2.76	9.90			N/A	N/A
4 - Stonebridge Blvd	0.64	0.03	0.26	0.64	0.64			N/A	N/A

17:30 - 17:45

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Main Street	3.96	0.03	0.28	3.96	9.38			N/A	N/A
2 - Stonebridge Blvd	0.94	0.03	0.27	0.94	1.49			N/A	N/A
3 - Main Street	2.40	0.03	0.26	2.40	2.40			N/A	N/A
4 - Stonebridge Blvd	0.57	0.03	0.28	0.71	2.14			N/A	N/A

17:45 - 18:00

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Main Street	2.54	0.04	0.40	6.84	12.83			N/A	N/A
2 - Stonebridge Blvd	0.72	0.08	0.79	1.40	1.47			N/A	N/A
3 - Main Street	1.78	0.06	0.73	4.51	6.78			N/A	N/A
4 - Stonebridge Blvd	0.45	0.00	0.00	0.45	0.45			N/A	N/A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Beck & Main.j9
Path: C:\Users\DPerks\Desktop\Wasaga Beach EA\Design\ARCADY
Report generation date: 8/31/2020 9:47:49 AM

Summary of intersection performance

	PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Beck & Main - 2041							
1 - Main Street	5.1	27.9	16.65	0.85	C	12.98	B	12 % [1 - Main Street]
2 - Beck Street	0.2	0.5	8.40	0.15	A			
3 - Main Street	2.6	8.7	10.26	0.73	B			
4 - Beck Street	0.8	1.8	9.04	0.44	A			

There are warnings associated with this model run - see the 'Data Errors and Warnings' tables.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	8/17/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	B-9GJ6XZ1\DPerks
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
✓	✓	Delay	0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Beck & Main	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2041	PM	PHF	17:00	18:00	15

Beck & Main - 2041, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	Beck & Main	Standard Roundabout		1, 2, 3, 4	12.98	B

Intersection Network Options

Driving side	Lighting	Network residual capacity (%)	First leg reaching threshold
Right	Normal/unknown	12	1 - Main Street

Legs

Legs

Leg	Name	Description
1	Main Street	
2	Beck Street	
3	Main Street	
4	Beck Street	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Main Street	2.50	5.00	30.0	20.0	40.0	15.0	
2 - Beck Street	2.00	4.00	30.0	20.0	40.0	15.0	
3 - Main Street	2.50	5.00	30.0	20.0	40.0	15.0	
4 - Beck Street	2.00	4.00	30.0	20.0	40.0	15.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1 - Main Street	0.603	1426
2 - Beck Street	0.550	1163
3 - Main Street	0.603	1426
4 - Beck Street	0.550	1163

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Main Street		✓	1033	100.000
2 - Beck Street		✓	71	100.000
3 - Main Street		✓	859	100.000
4 - Beck Street		✓	287	100.000

Peak Hour Factor Data (Traffic)

Leg	Hourly volume (Veh/hr)	Peak hour factor	Peak time segment
1 - Main Street	1033	0.92	SecondQuarter
2 - Beck Street	71	0.92	SecondQuarter
3 - Main Street	859	0.92	SecondQuarter
4 - Beck Street	287	0.92	SecondQuarter

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Main Street	**2 - Beck Street**	**3 - Main Street**	**4 - Beck Street**
From	**1 - Main Street**	0	40	807	186
	2 - Beck Street	34	0	27	10
	3 - Main Street	699	30	0	130
	4 - Beck Street	153	18	116	0

Vehicle Mix

Truck Percentages

		To			
		1 - Main Street	**2 - Beck Street**	**3 - Main Street**	**4 - Beck Street**
From	**1 - Main Street**	0	0	0	0
	2 - Beck Street	0	0	0	0
	3 - Main Street	0	0	0	0
	4 - Beck Street	0	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS
1 - Main Street	0.85	16.65	5.1	27.9	C
2 - Beck Street	0.15	8.40	0.2	0.5	A
3 - Main Street	0.73	10.26	2.6	8.7	B
4 - Beck Street	0.44	9.04	0.8	1.8	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Main Street	973	153	1334	0.730	963	2.6	9.459	A
2 - Beck Street	67	1034	594	0.113	66	0.1	6.819	A
3 - Main Street	809	214	1297	0.624	803	1.6	7.195	A
4 - Beck Street	270	713	771	0.351	268	0.5	7.137	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Main Street	1123	178	1319	0.851	1113	5.1	16.654	C
2 - Beck Street	77	1195	505	0.153	77	0.2	8.405	A
3 - Main Street	934	248	1277	0.731	930	2.6	10.258	B
4 - Beck Street	312	826	708	0.440	311	0.8	9.035	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Main Street	1063	169	1324	0.803	1066	4.3	14.172	B
2 - Beck Street	73	1144	533	0.137	73	0.2	7.829	A
3 - Main Street	884	237	1283	0.689	885	2.3	9.088	A
4 - Beck Street	295	786	730	0.404	296	0.7	8.293	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Main Street	973	155	1333	0.730	979	2.8	10.350	B
2 - Beck Street	67	1051	585	0.114	67	0.1	6.958	A
3 - Main Street	809	218	1295	0.625	811	1.7	7.485	A
4 - Beck Street	270	721	766	0.353	271	0.6	7.275	A

Queue Variation Results for each time segment

17:00 - 17:15

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Main Street	2.60	0.06	1.00	6.84	10.34			N/A	N/A
2 - Beck Street	0.13	0.00	0.00	0.13	0.13			N/A	N/A
3 - Main Street	1.62	0.07	0.96	3.75	5.35			N/A	N/A
4 - Beck Street	0.53	0.53	1.00	1.40	1.45			N/A	N/A

17:15 - 17:30

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Main Street	5.12	0.04	0.35	11.31	27.95			N/A	N/A
2 - Beck Street	0.18	0.03	0.26	0.46	0.49			N/A	N/A
3 - Main Street	2.62	0.03	0.29	2.62	8.74			N/A	N/A
4 - Beck Street	0.77	0.03	0.26	0.77	0.77			N/A	N/A

17:30 - 17:45

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Main Street	4.31	0.03	0.28	4.31	10.40			N/A	N/A
2 - Beck Street	0.16	0.03	0.25	0.45	0.48			N/A	N/A
3 - Main Street	2.28	0.03	0.26	2.28	2.28			N/A	N/A
4 - Beck Street	0.69	0.03	0.27	0.69	1.81			N/A	N/A

17:45 - 18:00

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Main Street	2.81	0.04	0.40	7.56	14.35			N/A	N/A
2 - Beck Street	0.13	0.00	0.00	0.13	0.13			N/A	N/A
3 - Main Street	1.70	0.06	0.79	4.18	6.21			N/A	N/A
4 - Beck Street	0.55	0.07	0.72	1.34	1.42			N/A	N/A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Spruce & Main & Mosley - 2041 PM.j9
Path: C:\Users\DPerks\Desktop\Wasaga Beach EA\Design\ARCADY
Report generation date: 9/1/2020 5:00:18 PM

Summary of intersection performance

	PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Main/Spruce/Mosley - 2041							
1 - Spruce Street	0.2	0.5	4.64	0.17	A	8.59	A	32 % [2 - Mosley Street]
2 - Mosley Street	2.6	7.5	9.37	0.73	A			
3 - Main Street	2.2	4.5	8.44	0.69	A			

There are warnings associated with this model run - see the 'Data Errors and Warnings' tables.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	8/17/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	B-9GJ6XZ1\DPerks
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
✓	✓	Delay	0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Main/Spruce/Mosley	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2041	PM	PHF	17:00	18:00	15

Main/Spruce/Mosley - 2041, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	Main/Spruce/Mosley	Standard Roundabout		1, 2, 3	8.59	A

Intersection Network Options

Driving side	Lighting	Network residual capacity (%)	First leg reaching threshold
Right	Normal/unknown	32	2 - Mosley Street

Legs

Legs

Leg	Name	Description
1	Spruce Street	
2	Mosley Street	
3	Main Street	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Spruce Street	2.50	5.00	30.0	20.0	40.0	15.0	
2 - Mosley Street	2.50	5.00	30.0	20.0	40.0	15.0	
3 - Main Street	2.50	5.00	30.0	20.0	40.0	15.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1 - Spruce Street	0.603	1426
2 - Mosley Street	0.603	1426
3 - Main Street	0.603	1426

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Spruce Street		✓	148	100.000
2 - Mosley Street		✓	921	100.000
3 - Main Street		✓	869	100.000

Peak Hour Factor Data (Traffic)

Leg	Hourly volume (Veh/hr)	Peak hour factor	Peak time segment
1 - Spruce Street	148	0.92	SecondQuarter
2 - Mosley Street	921	0.92	SecondQuarter
3 - Main Street	869	0.92	SecondQuarter

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Spruce Street	2 - Mosley Street	3 - Main Street
From	1 - Spruce Street	0	74	74
	2 - Mosley Street	93	0	828
	3 - Main Street	120	749	0

Vehicle Mix

Truck Percentages

		To		
		1 - Spruce Street	2 - Mosley Street	3 - Main Street
From	1 - Spruce Street	0	0	0
	2 - Mosley Street	0	0	0
	3 - Main Street	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS
1 - Spruce Street	0.17	4.64	0.2	0.5	A
2 - Mosley Street	0.73	9.37	2.6	7.5	A
3 - Main Street	0.69	8.44	2.2	4.5	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Spruce Street	139	701	1004	0.139	139	0.2	4.160	A
2 - Mosley Street	868	69	1384	0.627	861	1.6	6.798	A
3 - Main Street	819	87	1374	0.596	813	1.4	6.356	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Spruce Street	161	812	937	0.172	161	0.2	4.637	A
2 - Mosley Street	1001	80	1378	0.727	997	2.6	9.373	A
3 - Main Street	945	101	1365	0.692	942	2.2	8.436	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Spruce Street	152	772	961	0.158	152	0.2	4.454	A
2 - Mosley Street	948	76	1380	0.687	949	2.2	8.380	A
3 - Main Street	894	96	1368	0.654	895	1.9	7.628	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Spruce Street	139	707	1000	0.139	140	0.2	4.186	A
2 - Mosley Street	868	70	1384	0.627	870	1.7	7.032	A
3 - Main Street	819	88	1373	0.596	820	1.5	6.532	A

Queue Variation Results for each time segment

17:00 - 17:15

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Spruce Street	0.16	0.00	0.00	0.16	0.16			N/A	N/A
2 - Mosley Street	1.65	0.07	0.95	3.83	5.51			N/A	N/A
3 - Main Street	1.45	0.07	0.97	3.11	4.40			N/A	N/A

17:15 - 17:30

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Spruce Street	0.21	0.03	0.25	0.46	0.48			N/A	N/A
2 - Mosley Street	2.57	0.03	0.28	2.57	7.46			N/A	N/A
3 - Main Street	2.18	0.03	0.27	2.18	4.23			N/A	N/A

17:30 - 17:45

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Spruce Street	0.19	0.03	0.26	0.46	0.49			N/A	N/A
2 - Mosley Street	2.25	0.03	0.26	2.25	2.25			N/A	N/A
3 - Main Street	1.93	0.03	0.26	1.93	1.93			N/A	N/A

17:45 - 18:00

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Spruce Street	0.16	0.00	0.00	0.16	0.16			N/A	N/A
2 - Mosley Street	1.71	0.06	0.88	4.12	6.01			N/A	N/A
3 - Main Street	1.50	0.07	1.02	3.23	4.51			N/A	N/A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: 1st & Mosley - 2041 PM.j9
Path: C:\Users\DPerks\Desktop\Wasaga Beach EA\Design\ARCADY
Report generation date: 9/1/2020 4:57:35 PM

Summary of intersection performance

	PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Main/Spruce/Mosley - 2041							
1 - Mosley Street	1.8	3.4	7.51	0.65	A	8.28	A	31 % [3 - Mosley Street]
2 - 1st Street	0.2	0.7	4.69	0.19	A			
3 - Mosley Street	2.6	8.1	9.60	0.73	A			

There are warnings associated with this model run - see the 'Data Errors and Warnings' tables.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	8/17/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	B-9GJ6XZ1\DPerks
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
✓	✓	Delay	0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Main/Spruce/Mosley	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2041	PM	PHF	17:00	18:00	15

Main/Spruce/Mosley - 2041, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	Main/Spruce/Mosley	Standard Roundabout		1, 2, 3	8.28	A

Intersection Network Options

Driving side	Lighting	Network residual capacity (%)	First leg reaching threshold
Right	Normal/unknown	31	3 - Mosley Street

Legs

Legs

Leg	Name	Description
1	Mosley Street	
2	1st Street	
3	Mosley Street	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Mosley Street	2.50	5.00	30.0	20.0	40.0	15.0	
2 - 1st Street	2.50	5.00	30.0	20.0	40.0	15.0	
3 - Mosley Street	2.50	5.00	30.0	20.0	40.0	15.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1 - Mosley Street	0.603	1426
2 - 1st Street	0.603	1426
3 - Mosley Street	0.603	1426

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Mosley Street		✓	824	100.000
2 - 1st Street		✓	163	100.000
3 - Mosley Street		✓	923	100.000

Peak Hour Factor Data (Traffic)

Leg	Hourly volume (Veh/hr)	Peak hour factor	Peak time segment
1 - Mosley Street	824	0.92	SecondQuarter
2 - 1st Street	163	0.92	SecondQuarter
3 - Mosley Street	923	0.92	SecondQuarter

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Mosley Street	**2 - 1st Street**	**3 - Mosley Street**
From	**1 - Mosley Street**	0	86	738
	2 - 1st Street	85	0	78
	3 - Mosley Street	837	86	0

Vehicle Mix

Truck Percentages

		To		
		1 - Mosley Street	**2 - 1st Street**	**3 - Mosley Street**
From	**1 - Mosley Street**	0	0	0
	2 - 1st Street	0	0	0
	3 - Mosley Street	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS
1 - Mosley Street	0.65	7.51	1.8	3.4	A
2 - 1st Street	0.19	4.69	0.2	0.7	A
3 - Mosley Street	0.73	9.60	2.6	8.1	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Mosley Street	776	80	1378	0.563	771	1.3	5.890	A
2 - 1st Street	154	691	1010	0.152	153	0.2	4.198	A
3 - Mosley Street	869	80	1378	0.631	863	1.7	6.901	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Mosley Street	896	93	1370	0.654	893	1.8	7.515	A
2 - 1st Street	177	800	944	0.188	177	0.2	4.694	A
3 - Mosley Street	1003	92	1370	0.732	999	2.6	9.599	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Mosley Street	848	89	1373	0.618	849	1.6	6.882	A
2 - 1st Street	168	760	968	0.173	168	0.2	4.502	A
3 - Mosley Street	950	88	1373	0.692	951	2.3	8.558	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Mosley Street	776	81	1377	0.564	778	1.3	6.020	A
2 - 1st Street	154	696	1006	0.153	154	0.2	4.223	A
3 - Mosley Street	869	80	1378	0.631	872	1.7	7.148	A

Queue Variation Results for each time segment

17:00 - 17:15

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Mosley Street	1.27	0.08	0.98	2.52	3.40			N/A	N/A
2 - 1st Street	0.18	0.00	0.00	0.18	0.18			N/A	N/A
3 - Mosley Street	1.67	0.06	0.94	3.92	5.67			N/A	N/A

17:15 - 17:30

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Mosley Street	1.85	0.03	0.27	1.85	1.85			N/A	N/A
2 - 1st Street	0.23	0.03	0.25	0.46	0.48			N/A	N/A
3 - Mosley Street	2.63	0.03	0.28	2.63	8.11			N/A	N/A

17:30 - 17:45

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Mosley Street	1.64	0.03	0.26	1.64	1.64			N/A	N/A
2 - 1st Street	0.21	0.03	0.27	0.48	0.74			N/A	N/A
3 - Mosley Street	2.30	0.03	0.26	2.30	2.30			N/A	N/A

17:45 - 18:00

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Mosley Street	1.31	0.09	1.08	2.44	3.14			N/A	N/A
2 - 1st Street	0.18	0.00	0.00	0.18	0.18			N/A	N/A
3 - Mosley Street	1.74	0.06	0.84	4.29	6.32			N/A	N/A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: 3rd & Mosley - 2041 PM.j9
Path: C:\Users\DPerks\Desktop\Wasaga Beach EA\Design\ARCADY
Report generation date: 9/1/2020 4:59:15 PM

Summary of intersection performance

	PM							
	Queue (Veh)	95% Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	3rd & Mosley - 2041							
1 - Mosley Street	1.6	2.6	6.58	0.62	A	7.49	A	37 % [3 - Mosley Street]
2 - 3rd Street	0.1	0.5	4.24	0.07	A			
3 - Mosley Street	2.3	5.0	8.50	0.70	A			

There are warnings associated with this model run - see the 'Data Errors and Warnings' tables.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	8/17/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	B-9GJ6XZ1\DPerks
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
✓	✓	Delay	0.85	36.00	20.00

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	3rd & Mosley	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2041	PM	PHF	17:00	18:00	15

3rd & Mosley - 2041, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		Truck% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If Truck% at the intersection is genuinely zero, please ignore this warning.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Intersection Network

Intersections

Intersection	Name	Intersection type	Use circulating lanes	Leg order	Intersection Delay (s)	Intersection LOS
1	3rd & Mosley	Standard Roundabout		1, 2, 3	7.49	A

Intersection Network Options

Driving side	Lighting	Network residual capacity (%)	First leg reaching threshold
Right	Normal/unknown	37	3 - Mosley Street

Legs

Legs

Leg	Name	Description
1	Mosley Street	
2	3rd Street	
3	Mosley Street	

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Mosley Street	2.50	5.00	30.0	20.0	40.0	15.0	
2 - 3rd Street	2.50	5.00	30.0	20.0	40.0	15.0	
3 - Mosley Street	2.50	5.00	30.0	20.0	40.0	15.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Leg	Final slope	Final intercept (PCE/hr)
1 - Mosley Street	0.603	1426
2 - 3rd Street	0.603	1426
3 - Mosley Street	0.603	1426

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix source	PCE Factor for a Truck (PCE)
Truck Percentages	2.00

Demand overview (Traffic)

Leg	Linked leg	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Mosley Street		✓	801	100.000
2 - 3rd Street		✓	60	100.000
3 - Mosley Street		✓	914	100.000

Peak Hour Factor Data (Traffic)

Leg	Hourly volume (Veh/hr)	Peak hour factor	Peak time segment
1 - Mosley Street	801	0.92	SecondQuarter
2 - 3rd Street	60	0.92	SecondQuarter
3 - Mosley Street	914	0.92	SecondQuarter

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Mosley Street	**2 - 3rd Street**	**3 - Mosley Street**
From	**1 - Mosley Street**	0	19	782
	2 - 3rd Street	24	0	36
	3 - Mosley Street	895	19	0

Vehicle Mix

Truck Percentages

		To		
		1 - Mosley Street	**2 - 3rd Street**	**3 - Mosley Street**
From	**1 - Mosley Street**	0	0	0
	2 - 3rd Street	0	0	0
	3 - Mosley Street	0	0	0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS
1 - Mosley Street	0.62	6.58	1.6	2.6	A
2 - 3rd Street	0.07	4.24	0.1	0.5	A
3 - Mosley Street	0.70	8.50	2.3	5.0	A

Main Results for each time segment

17:00 - 17:15

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Mosley Street	755	18	1415	0.533	750	1.1	5.375	A
2 - 3rd Street	57	732	985	0.057	56	0.1	3.877	A
3 - Mosley Street	861	23	1413	0.610	855	1.5	6.389	A

17:15 - 17:30

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Mosley Street	871	21	1414	0.616	869	1.6	6.584	A
2 - 3rd Street	65	848	915	0.071	65	0.1	4.237	A
3 - Mosley Street	993	26	1410	0.704	990	2.3	8.505	A

17:30 - 17:45

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Mosley Street	824	20	1414	0.583	825	1.4	6.114	A
2 - 3rd Street	62	805	941	0.066	62	0.1	4.098	A
3 - Mosley Street	940	25	1411	0.666	942	2.0	7.688	A

17:45 - 18:00

Leg	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	V/C Ratio	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Mosley Street	755	18	1415	0.533	756	1.2	5.465	A
2 - 3rd Street	57	738	981	0.058	57	0.1	3.894	A
3 - Mosley Street	861	23	1412	0.610	863	1.6	6.574	A

Queue Variation Results for each time segment

17:00 - 17:15

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Mosley Street	1.13	0.09	0.97	1.93	2.64			N/A	N/A
2 - 3rd Street	0.06	0.03	0.25	0.45	0.48			N/A	N/A
3 - Mosley Street	1.53	0.07	0.95	3.46	4.86			N/A	N/A

17:15 - 17:30

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Mosley Street	1.57	0.03	0.26	1.57	1.57			N/A	N/A
2 - 3rd Street	0.08	0.03	0.26	0.47	0.49			N/A	N/A
3 - Mosley Street	2.31	0.03	0.28	2.31	4.99			N/A	N/A

17:30 - 17:45

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Mosley Street	1.42	0.03	0.26	1.42	1.42			N/A	N/A
2 - 3rd Street	0.07	0.00	0.00	0.07	0.07			N/A	N/A
3 - Mosley Street	2.04	0.03	0.26	2.04	2.04			N/A	N/A

17:45 - 18:00

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - Mosley Street	1.16	0.14	1.07	1.80	2.20			N/A	N/A
2 - 3rd Street	0.06	0.00	0.00	0.06	0.06			N/A	N/A
3 - Mosley Street	1.59	0.07	1.00	3.59	4.99			N/A	N/A

Appendix O:
Public Information Centre 2

Main Street Reconstruction
& Beach Area 1&2 Revitalization
Municipal Class Environmental Assessment Study
Notice of Online Public Engagement

Background

The Town of Wasaga Beach is proposing improvements to the Main Street (River Road West to Mosley Street), Mosley Street (Main Street to 6th Street), Beach Drive and area corridors. The improvements are necessary to facilitate and support future growth within the study area and ensure that future transportation and infrastructure demands can be accommodated. As well as streetscaping options, the Environmental Assessment will identify various alternatives to implementing the needed improvements, with consideration given to road widening, intersection improvements, roundabouts and pedestrian and cycling facilities.

Study Process

The Town is proceeding with a Schedule C Municipal Class Environmental Assessment (EA) to consider and address the impacts associated with the proposed improvements.

Online public engagement is being offered to allow interested members of the public an opportunity to review and provide comment on the alternative design concepts, the recommendations and the next steps in the study process. A recorded presentation and display boards detailing the above, and describing the overall study and the results of the initial Public Information Centre, will be available for viewing on the Town's website (wasagabeach.com) for a 2-week period from Thursday September 24, 2020 to Thursday October 8, 2020. Members of the public are encouraged to submit comments by Thursday October 15, 2020 (a comment sheet is also available on the Town's website).

Recommended Design Concepts

The recommended design concepts consider the long-term transportation needs to support future growth and development of the area. The improvements focus on multi-user solutions and include streetscaping recommendations to revitalize and promote community engagement within the area. The recommended design concepts are as follows:

- Main Street: 3 lanes (1 per direction with a centre turn lane), sidewalks, on-street parking, flexible street zone (south side) and 2-lane cycle track (north side)
- Mosley Street: 3 lanes (1 per direction with a centre turn lane), sidewalks and outdoor retail/patio space on both sides of street
- Beach Drive: closed to vehicle traffic and replace with storefront walkway, event space, 2-lane cycle track, boardwalk and amenity space
- Roundabouts: consider future roundabouts at the Main Street intersections with River Road West, Stonebridge Boulevard and Beck Street
- River Avenue Crescent & Glenwood Drive: convert both street to 2-way operations with turn restrictions at River Avenue Crescent/Main Street

It is noted that these are the recommended solutions only. Upon receipt of agency and public comments, the final preferred solutions will be confirmed and an Environmental Study Report completed for Town review and council endorsement. Following this, the report will be available for public review and comment. A separate notice pertaining to this will be issued at that time.

Project Contacts

Owner
Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, ON L9Z 1A1
Mike Latimer, C.E.T.
Project Coordinator
m.latimer@wasagabeach.com
(705) 429-2540 x2342

Consultant
Tatham Engineering Ltd.
200 Sandford Fleming Dr. #200
Collingwood, ON L9Y 5A6
Michael Cullip, P.Eng
Project Manager
mcullip@tathameng.com
(705) 444-2565 x2020

This notice issued September 23, 2020

Main Street Reconstruction
& Beach Area 1&2 Revitalization
Municipal Class Environmental Assessment Study
Notice of Online Public Engagement

Background

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https://www.wasagabeach.com/town-hall/economic-development/build-wasaga/beachfront-development

Recommended Design Concepts

The recommended design concepts consider the long-term transportation needs to support future growth and development of the area. The improvements focus on multi-user solutions and include streetscaping recommendations to revitalize and promote community engagement within the area. The recommended design concepts are as follows:

- Main Street: 3 lanes (1 per direction with a centre turn lane), sidewalks, on-street parking, flexible street zone (south side) and 2-lane cycle track (north side)
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(705) 429-2540 x2342

Consultant
Tatham Engineering Ltd.
200 Sandford Fleming Dr. #200
Collingwood, ON L9Y 5A6
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Project Manager
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(705) 444-2565 x2020

This notice issued October 16, 2020

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Agency	Ministry of the Environment, Conservation & Parks	Barrie District Office	54 Cedar Pointe Dr. Unit 1201	Barrie, Ontario	L4N 5R7	Cindy	Hood	Ms.	Manager	705-309-5874	cindy.hood@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Central Region Office	Place Nouveau 5775 Yonge Street, 9th Floor	Toronto, Ontario	M2M 4J1	Chunmei	Liu	Ms.	EA Coordinator	416-326-4886	chunmei.lui@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Environmental Assessment Services	135 St. Clair Ave. W. 1st Floor	Toronto, Ontario	M4V 1P5	Annamaria	Cross	Ms.	Manager	416-314-7967	Annamaria.cross@ontario.ca
Agency	Ministry of the Environment, Conservation & Parks	Southwest Zone	1350 High Falls Road	Bracebridge	P1L 1W9	Meghan	Pomeroy	Ms.	Park Planner – Southwest Zone	705-646-5520	Meghan.Pomeroy@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Midhurst District Office	2284 Nursery Road	Midhurst, Ontario	L0L 1X0	Chantale	Gagnon	Ms.	Regional Advisor	705-241-2386	chantale.gagnon@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Heritage Planning Unit	401 Bay Street Suite 1701	Toronto, Ontario	M7A 0A7	Dan	Minkin	Mr.	Heritage Planner	416-314-7147	dan.minkin@ontario.ca
Agency	Ministry of Tourism, Culture & Sport	Archaeology Program Unit	401 Bay Street Suite 1700	Toronto, Ontario	M7A 0A7	Katherine	Cappella	Ms.	Manager	416-314-7132	katherine.cappella@ontario.ca
Agency	Ministry of Natural Resources & Forestry	Midhurst District	2284 Nursery Road	Midhurst, Ontario	L0L 1X0	Ken	Mott	Mr.	District Planner	705-725-7546	ken.mott@ontario.ca
Agency	Ministry of Natural Resources & Forestry	Wasaga Beach Provincial Park	11 22nd Street	Wasaga Beach, Ontario	L9Z 2V9	John	Fisher	Mr.	Park Superintendent		john.fisher@ontario.ca
Agency	Ministry of Municipal Affairs and Housing	Central Municipal Services Office	777 Bay Street 13th Floor	Toronto, Ontario	M5G 2E5	Aly	N. Alibhai	Mr.	Regional Director	416-585-7264	aly.alibhai@ontario.ca
Agency	Ministry of Agriculture, Food & Rural Affairs	OMAFRA Land-Use Policy & Stewardship	1 Stone Rd W. 3rd Floor	Guelph, Ontario	N1G 4Y2	John	Turvey	Mr.	Policy Advisor	519-766-8811	john.turvey@ontario.ca
Agency	Ministry of Transportation	Central Region, Planning & Design	159 Sir William Hearst Avenue, Bldg. “D”, 7th Floor	Toronto, Ontario	M3M 0B7	John	Mackinnon	Mr.	Area Manager	416-235-5533	john.mackinnon@ontario.ca
Agency	Ministry of Indigenous Affairs	Indigenous Relations Branch	160 Bloor Street E. Suite 400	Toronto, Ontario	M7A 2E6	Francois	Lachance	Mr.	Senior Advisor	416-326-4754	francois.lachance@ontario.ca

Last Updated: September 23, 2020

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Agency	Nottawasaga Valley Conservation Authority	John Hix Conservation Administration Centre	8195 8th Line	Utopia, Ontario	L0M 1T0	Doug	Hevenor	Mr.	Chief Administrative Officer	705-424-1479 ext. 225	dhevenor@nvca.on.ca
Agency	Lake Simcoe Region Conservation Authority		120 Bayview Parkway	Newmarket, Ontario	L3Y 3W3	Ben	Longstaff	Mr.	General Manager, Integrated Watershed Management	905-895-1281 ext. 305	b.longstaff@lsrca.on.ca
Agency	Simcoe Muskoka District Health Unit	15 Sperling Drive		Barrie, Ontario	L4M 6K9					705-721-7520	
Agency	Infrastructure Ontario	Realty Operations & Asset Management	1 Dundas Street West Suite 2000	Toronto, Ontario	M5G 1Z3	Sean	Wiley	Mr.	Executive Vice-President, Asset Management	416-327-3937	sean.wiley@infrastructureontario.ca
Agency	Infrastructure Ontario	Environmental Management				Cory	Ostrowka	Mr.			Cory.Ostrowka@infrastructureontario.ca
Agency (Federal)	Crown-Indigenous Relations & Northern Affairs Canada	Lands & Economic Development - Environment	655 Bay Street, Suite 700 8th Floor	Toronto, Ontario	M5G 2K4	Sunil	Bajaj	Mr.	Manager	416-973-4614	sunil.bajaj@canada.ca
Agency (Federal)	Department of Fisheries and Oceans	Fish & Fish Habitat Protection Program	867 Lakeshore Road	Burlington, Ontario	L7S 1A1	Tom	Hoggarth	Mr.	Regional Director, Ecosystems Management	905-336-4764	
Agency	Ontario Provincial Police	Huronia West Detachment	P.O. Box 140 1000 River Road West	Wasaga Beach, Ontario	L9Z 1A1						
Municipal	The County of Simcoe	Administration Centre	1110 Highway 26	Midhurst, Ontario	L9X 1N6	Mark	Aitkin	Mr.	Chief Administrative Officer	705-726-9300 ext.1260	cao@simcoe.ca
School Board	Simcoe County District School Board		1170 Highway 26	Midhurst, Ontario	L9X 1N6	Andrew	Keuken	Mr.	Manager of Planning, Enrolment & Community Use	705-734-6363 ext. 11513	akeuken@scdsb.on.ca
School Board	Simcoe Muskoka Catholic District School Board	46 Alliance Blvd.		Barrie, Ontario	L4M 5K3	Christine	Hyde	Ms.	Manager of Planning & Development	705-722-3555 ext. 351 (?)	chyde@smcdsb.on.ca
School Board	Simcoe County Student Transportation Consortium	64 Cedar Pointe Drive Suite 1403		Barrie, Ontario	L4N 5R7	Bonnie	Branch	Ms.	Transportation Coordinator	705-733-8965	bbranch@scstc.ca
Utility	Bell Canada	136 Bayfield Street	Floor 2	Barrie, Ontario	L4M 3B1	Andrew	Fournier	Mr.	Manager, Access Network	705-722-2677	andrew.fournier@bell.ca
Utility	Rogers Cable Systems	1 Sperling Drive	P.O. Box 8500	Barrie, Ontario	L4M 6B8	Tony	Dominguez	Mr.	Systems Planner	705-737-4660	tony.dominguez@rci.rogers.com

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
Utility	Hydro One	Subdivision Group	420 Welham Road	Barrie, Ontario	L4N 8Z2	Heather	McTeer	Ms.			
Utility	Hydro One Network	45 Sarjeant Drive	P.O. Box 6700	Barrie, Ontario	L4M 5N5	Business Customer Centre					
Utility	Ontario Power Generation	700 University Avenue		Toronto, Ontario	M5G 1X6	Christopher F.	Ginther	Ms.	Chief Administrative Officer	416-592-2555	
Utility	Wasaga Distribution Inc.	P.O. Box 20	950 River Road West	Wasaga Beach, Ontario	L9Z 1A1						
Utility	Enbridge Gas Distribution Inc.	10 Churchill Dr.		Barrie, Ontario	L4N 8Z5	David	Smith	Mr.	Sales Development Representative	705-739-5254	
Utility	Union Gas	1590 8th Street East		Owen Sound, Ontario	N4K 0A2	Derrick	Cunningham	Mr.			
First Nations Community	Chippewas of Georgina Island	R. R. #2	P.O. Box N-13	Sutton West, ON	LOE 1RO	Donna	Big Canoe	Ms.	Chief	705 437-1337	
First Nations Community	Chippewas of Rama First Nation	5884 Rama Road	Suite 200	Rama, Ontario	L3V 6H6	Rodney	Noganosh		Chief	705-325-3611	
First Nations Community	Wahta Mohawk	P.O. Box 260	2664 Muskoka Road 38	Bala, Ontario	P0C 1A0	Philip	Franks		Chief	705-762-2354	
First Nations Community	Moose Dear Point	3719 Twelve Mile Bay Road	P.O. Box 119	Mac Tier, Ontario	P0C 1H0	Barron	King		Chief	705-375-5209	
First Nations Community	Wasauksing First Nation	P.O. Box 250	1508 Geewadin Road	Parry Sound, Ontario	P2A 2X4	Warren	Tabobondung		Chief	705-746-2531	
First Nations Community	Coordinator for Williams Treaties First Nation	8 Creswick Court		Barrie, Ontario	L4M 2J7	Karry	Sandy-McKenzie	Ms.	Barrister & Solicitor		inquiries@williamstreatiesfirstnations.ca
First Nations Community	Beausoleil First Nation (Christian Island)	11 O'Gemaa Miikaan		Christian Island, Ontario	L9M 0A9	Guy	Monague		Chief	705-247-2051	
First Nations Community	Georgian Bay Métis Council	355 Cranston Crescent	PO Box 4	Midland, Ontario	L4R 4K6	Greg	Garratt	Mr.	President	705-526-6335	greggarratt@gmail.com
First Nations Community	Moon River Métis Council		385a Bethune Drive North	Gravenhurst, Ontario	P1P 1B8	Tony	Muscat	Mr.	President		
First Nations Community	Métis Nation of Ontario - Head Office	66 Slater Street	Suite 1100	Ottawa, Ontario	K1P 5H1						

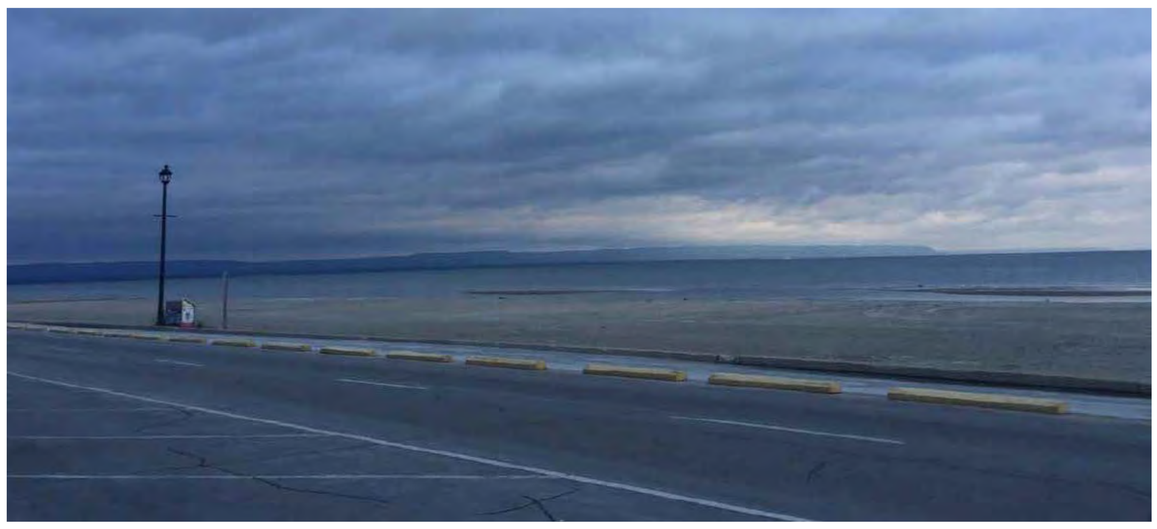
Last Updated: September 23, 2020

Main Street & Beach Area 1&2 Class EA: Agency Contacts

Type	Company	Address1	Address2	City	PostalCode	FirstName	LastName	Title	JobTitle	WorkPhone	Email
First Nations Community	La Nation Huronne-Wendat (Huron-Wendat First Nation)	Centre Administratif	255 Place Chef Michel Laveau	Wendake, Quebec	G0A 4V0	Konrad H.	Sioui		Grand Chief	418-843-3767	

Last Updated: September 23, 2020


Courtesy of Forrec Limited




Photos/pictures sourced from Urban Design Guidelines (WSP) & Downtown Development Master Plan (FORREC)

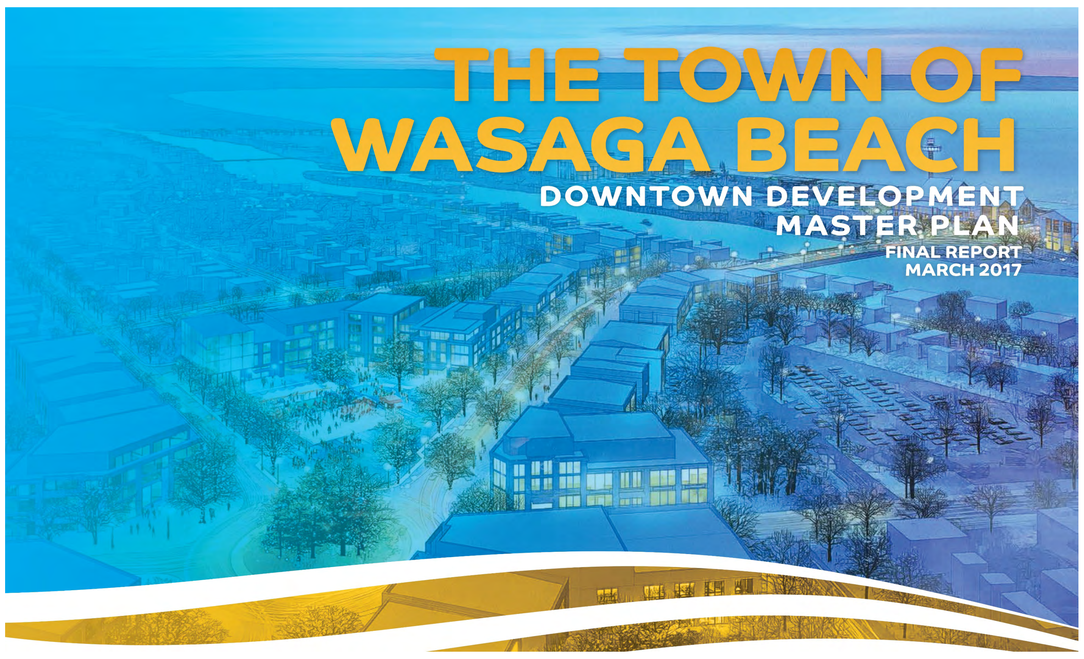
Main Street and Beach Areas 1 & 2 Improvements

PUBLIC INFORMATION CENTRE 2

BACKGROUND

Over the past several years, the Town has undertaken a number of initiatives relating to the redevelopment of Main Street and Beach Areas 1 & 2. The most significant to this project include:

- **Downtown Development Master Plan (DDMP)**
  - The DDMP was "*designed to promote the evolution of a livable, compact, accessible, sustainable downtown for the entire community .*"



- **Downtown Wasaga Beach Urban Design Guidelines (UDG)**
  - Intended to "*encourage development that supports and implements the objectives that are outlined in the DDMP.*"

OBJECTIVE OF THE STUDY

The objective of this study is to identify and facilitate the implementation of improvements to the study area transportation network in consideration of:

- the natural, socio-economic & heritage environments
- the needs of pedestrians
- the needs of cyclists
- the needs of motorists
- goals and objectives identified in the DDMP, UDG and supporting studies

PURPOSE OF THE STUDY

The purpose of this study is:

- develop alternative solutions to improve the local road network and renew infrastructure to facilitate the overall objectives of the DDMP and UDG
- identify the location, extent and sensitivity of affected environments
- assess the alternatives given potential environmental impacts
- identify the preferred solutions
- establish measures to mitigate impacts
- satisfy the Class EA requirements

PURPOSE OF PIC 2

The purpose of this Public Information Centre (PIC 2) is to:

- continue open channels of communication with public and stakeholders
- detail the study area, study purpose and objective
- review the preferred solutions from PIC 1
- identify alternative design concepts to implement the preferred solutions
- seek input and comments for consideration in the selection of the preferred designs

THE ROLE OF THE PUBLIC

To assist in the completion of this study, the public and stakeholders should:

- review the presentation material
- ask questions of the Town and/or Consultant
- make your opinions known
- submit a comment sheet
- indicate whether you want to be added to the mailing list to be kept informed of the process and future events

DOWNTOWN VISION

The Town of Wasaga Beach has identified the beachfront and surrounding area, consisting of the Main Street, Mosley Street and Beach Drive corridors, as an integral component of the Town's vision to develop a livable, accessible and sustainable all-season town-centre for the entire community, including existing and future residents and visitors.

In consideration of the existing road and infrastructure conditions, and in context of the requirements to support the Town's vision for a Downtown as identified in the *Downtown Development Master Plan* with respect to traffic volumes (vehicular, cycling and pedestrian) and municipal services, a Problem/Opportunity Statement has been defined.

PROBLEM / OPPORTUNITY STATEMENT

That existing traffic and infrastructure needs and deficiencies along the subject lengths of Main Street (from River Road West to Mosley Street), Mosley Street (from Main Street to 6th Street) and Beach Drive be addressed in an environmentally sound manner, in consideration of future traffic needs, current Town standards, active transportation opportunities and municipal infrastructure requirements, with the objective of facilitating future growth while providing safe and efficient travel for all road users."

PROCESS TO ADDRESS THE PROBLEM / OPPORTUNITY STATEMENT

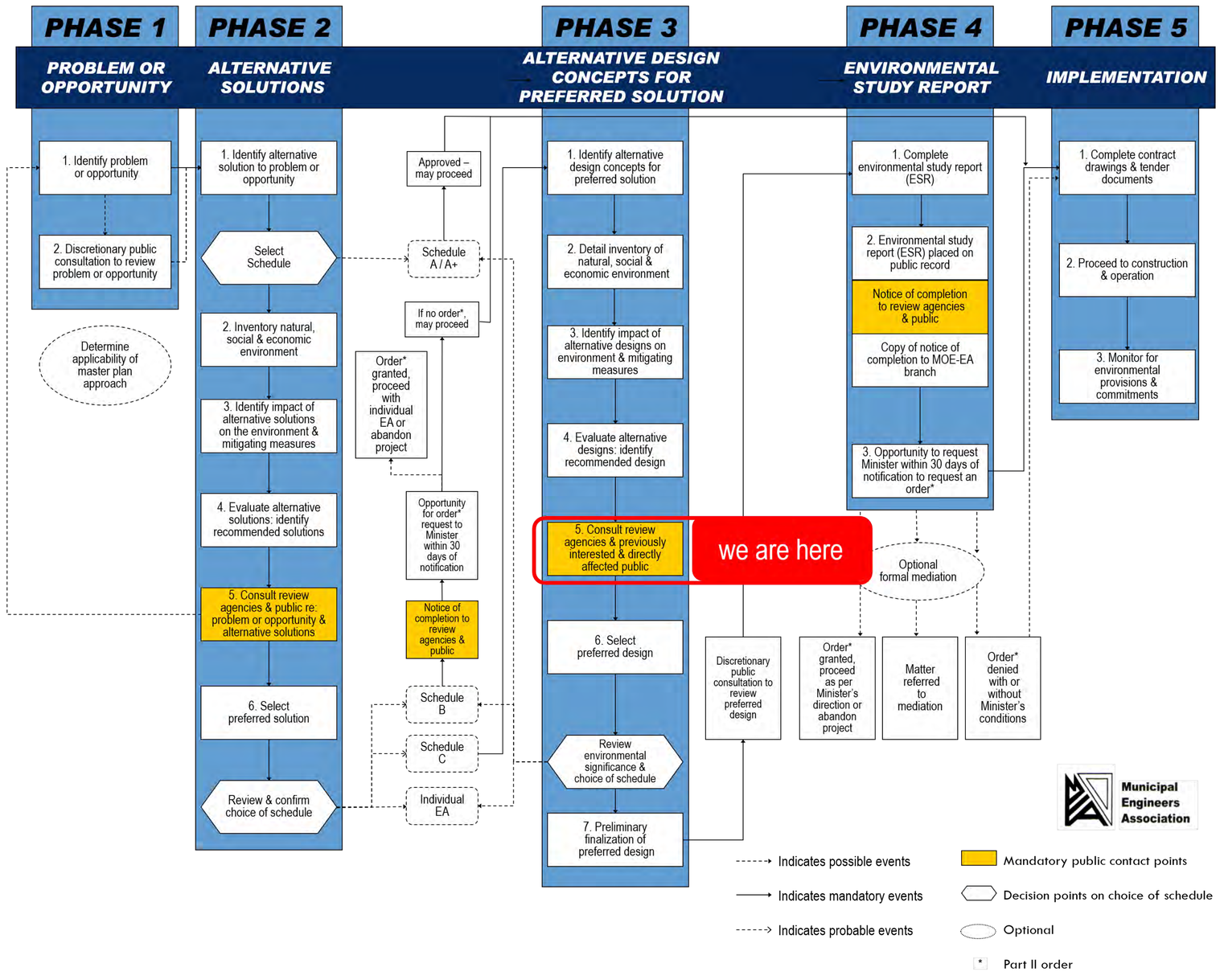
To address the problem/opportunity statement and explore opportunities for improvements to Main St and Beach Areas 1 & 2, a Class Environmental Assessment will be undertaken.

The Class EA schedule is based on the type of project, potential impacts and construction value.

The project will be undertaken as a Schedule C Class EA, with the completion of Phases 1 to 5 (see aside).

Opportunities for public review & input include:

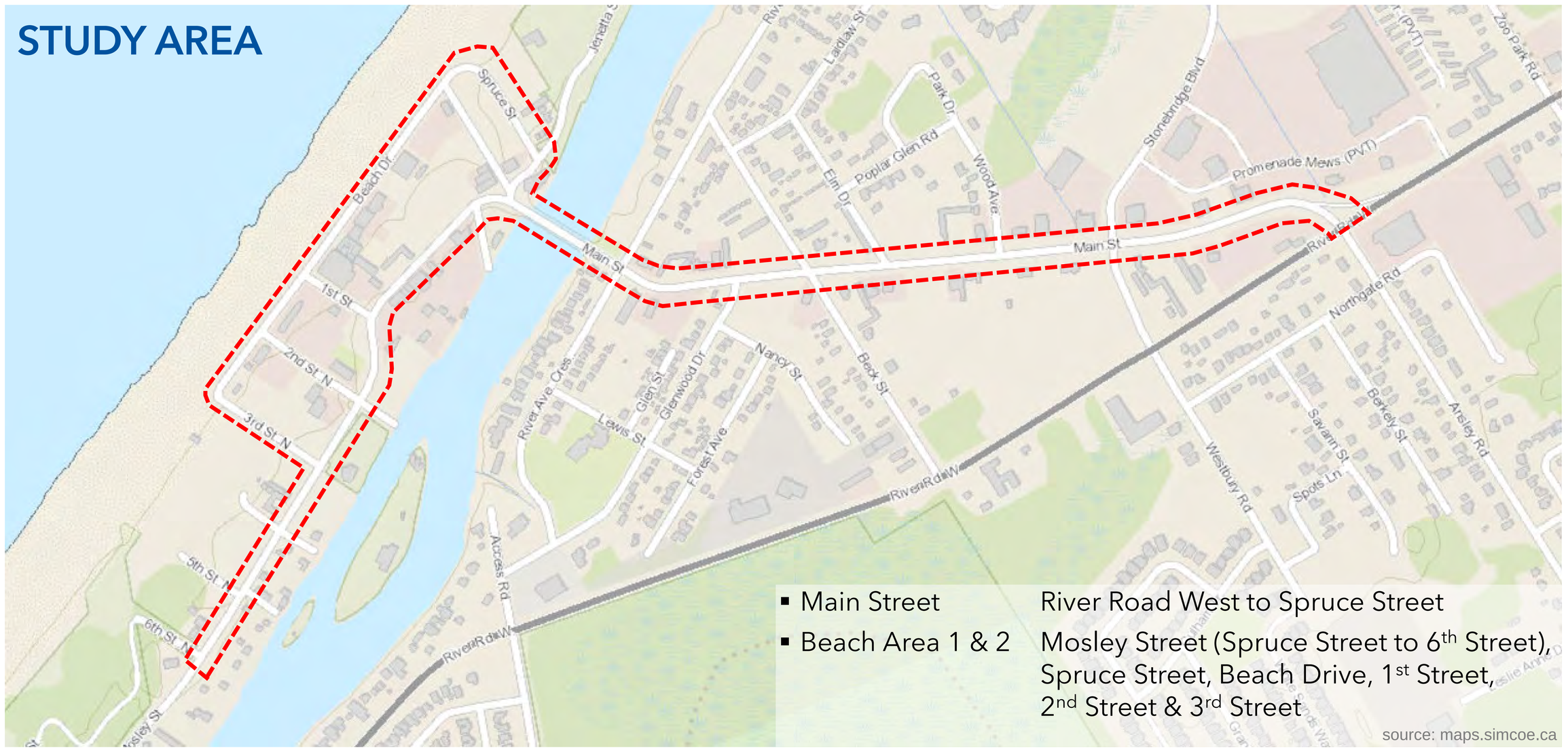
- response to notices (Notice of Commencement, Notice of PICs x2 and Notice of Completion)
- public information centres (PICs x2)
- 30-day review of final report



Main Street and Beach Areas 1 & 2 Improvements

PROBLEM IDENTIFICATION

STUDY AREA

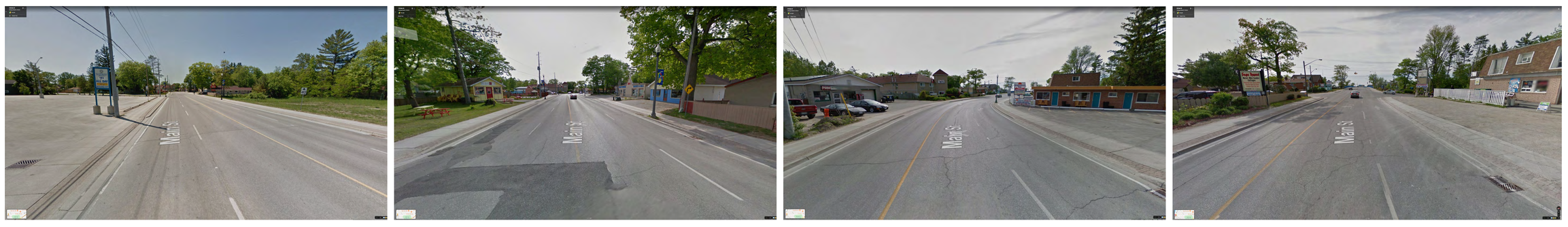


- Main Street — River Road West to Spruce Street
- Beach Area 1 & 2 — Mosley Street (Spruce Street to 6th Street), Spruce Street, Beach Drive, 1st Street, 2nd Street & 3rd Street

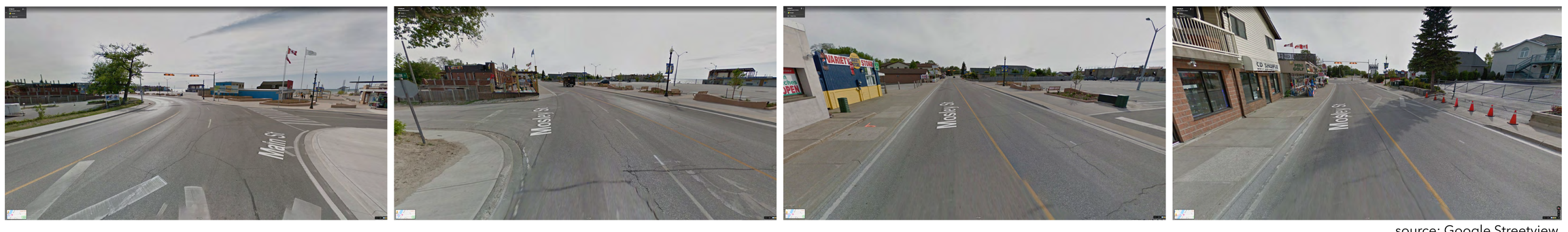
source: maps.simcoe.ca

MAIN STREET – River Road West to Stonebridge Boulevard

MAIN STREET – Stonebridge Boulevard to Beck Street



MAIN STREET – Beck Street to River Avenue Crescent / River Road East



source: Google Streetview

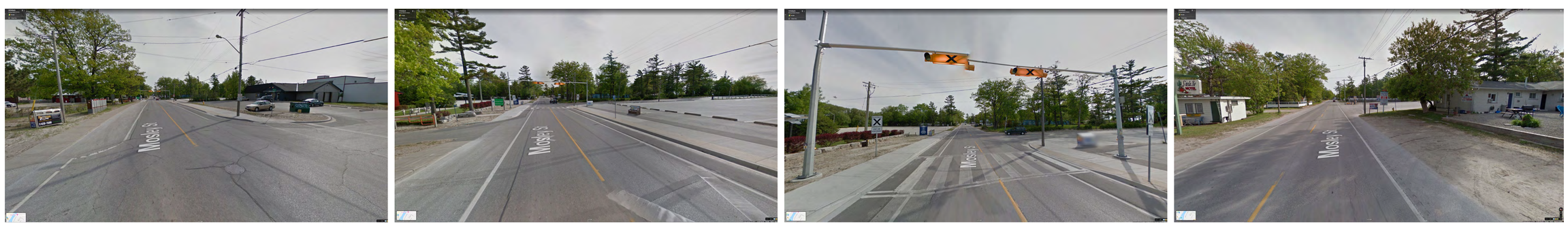
MOSLEY STREET – Spruce Street to 1st Street

Main Street and Beach Areas 1 & 2 Improvements

EXISTING CONDITIONS

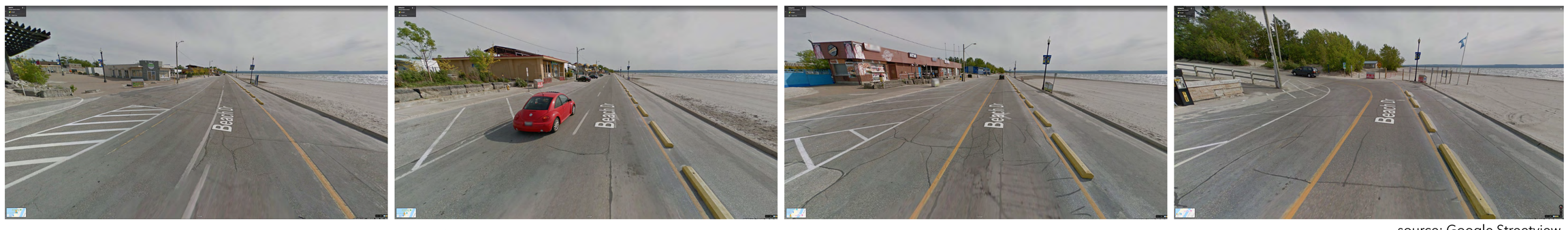
AERIAL MAPPING

MOSLEY STREET – 1st Street to 2nd Street



MOSLEY STREET – 2nd Street to 3rd Street

MOSLEY STREET – 3rd Street to 6th Street



BEACH DRIVE – Spruce Street to 3rd Street

source: Google Streetview

Main Street and Beach Areas 1 & 2 Improvements

EXISTING CONDITIONS

ALTERNATIVE SOLUTIONS

Alternative Solutions were presented at PIC 1 to illustrate different options to addressing the Problem/Opportunity Statement in consideration of the following:

RIGHT-OF-WAY
What is the available road right-of-way within which the improvements must be assembled?

VEHICLES
What is the most appropriate manner to address more vehicle travel demands?

PARKING
What is the most appropriate manner to accommodate demands for parking?

BICYCLES
What is the most appropriate manner to address bicycle travel demands?

PEDESTRIANS
What is the most appropriate manner to address pedestrian travel demands?

RETAIL / COMMERCIAL
What opportunities can be provided to support retail / commercial development?

EVALUATION OF SOLUTIONS

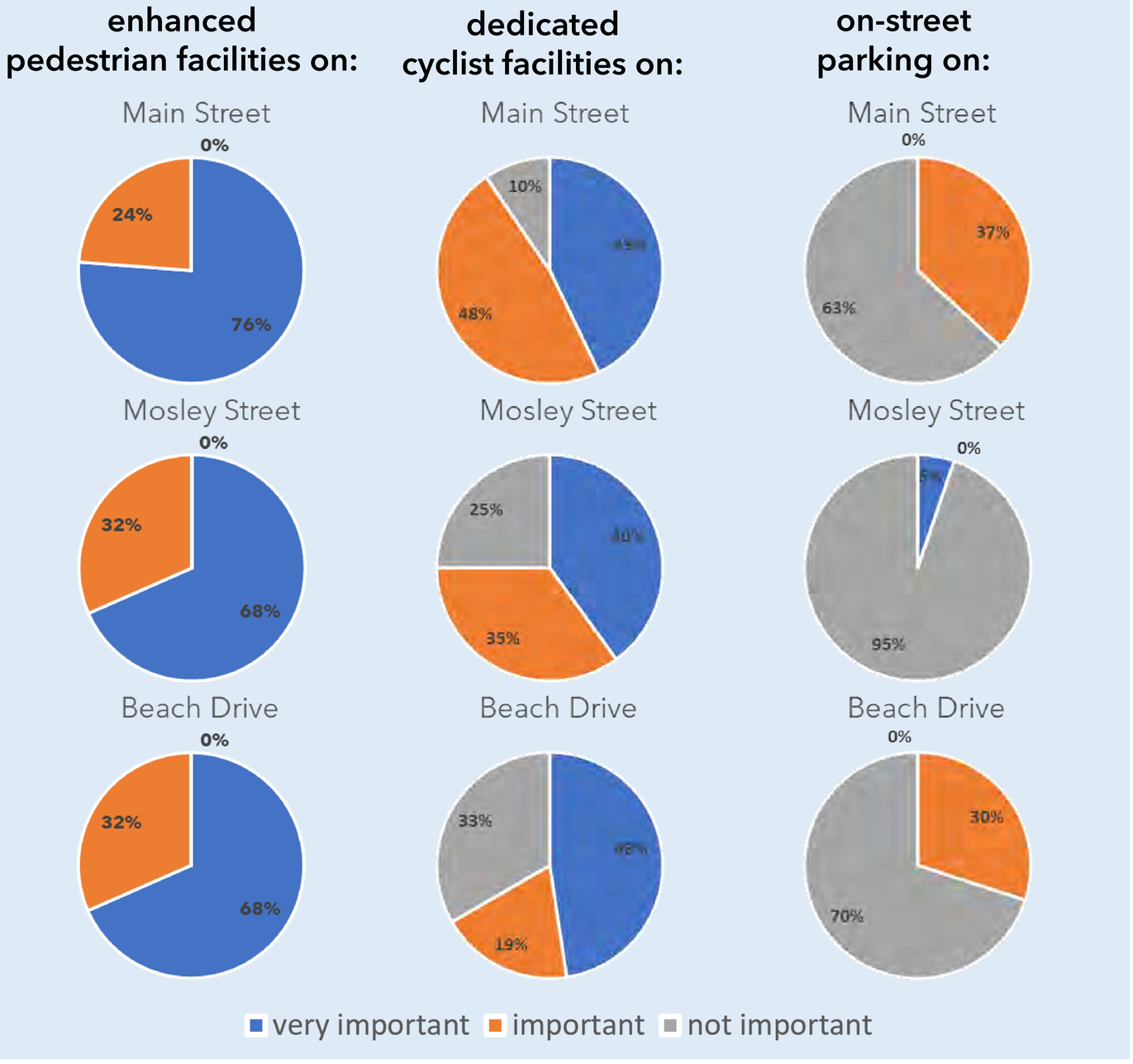
The Alternative Solutions were evaluated based on their ability to achieve the study objectives (namely to accommodate future travel needs of all road users -motorists, cyclists & pedestrians) and the resulting impacts to the following environments:

Transportation **Natural** **Cultural** **Social** **Economic**

SUMMARY OF PUBLIC INPUT

At PIC 1, a Public Comment Sheet was made available to further solicit input pertaining to the Alternative Solutions and those elements that are of most importance to the public. Respondents were asked:

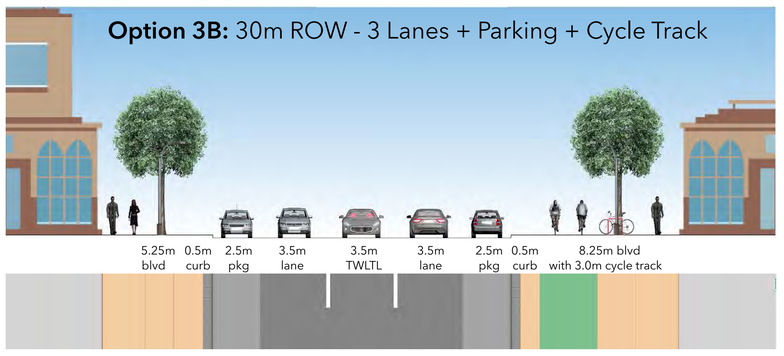
How important is it for you to have …



PREFERRED SOLUTIONS

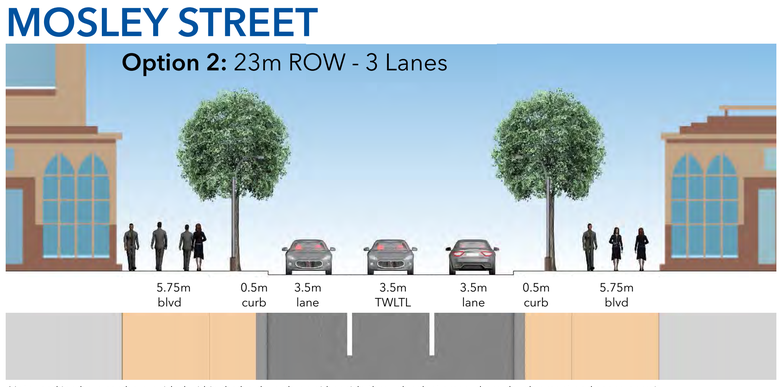
The Preferred Solutions were based on the evaluation, consultation with the Town and consideration of the public input received.

MAIN STREET



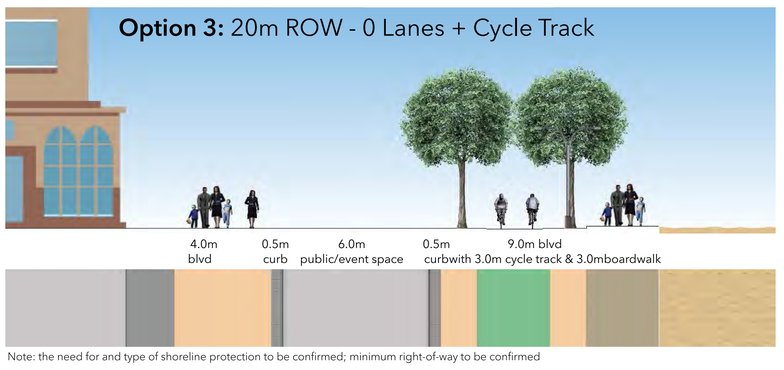
Note: parking lanes can be converted to bump-outs at intersections or at select mid-block locations to increase boulevard space and public realm opportunities

MOSLEY STREET



Note: parking bays can be provided within the boulevards on either side through select areas where development and space permit

BEACH DRIVE

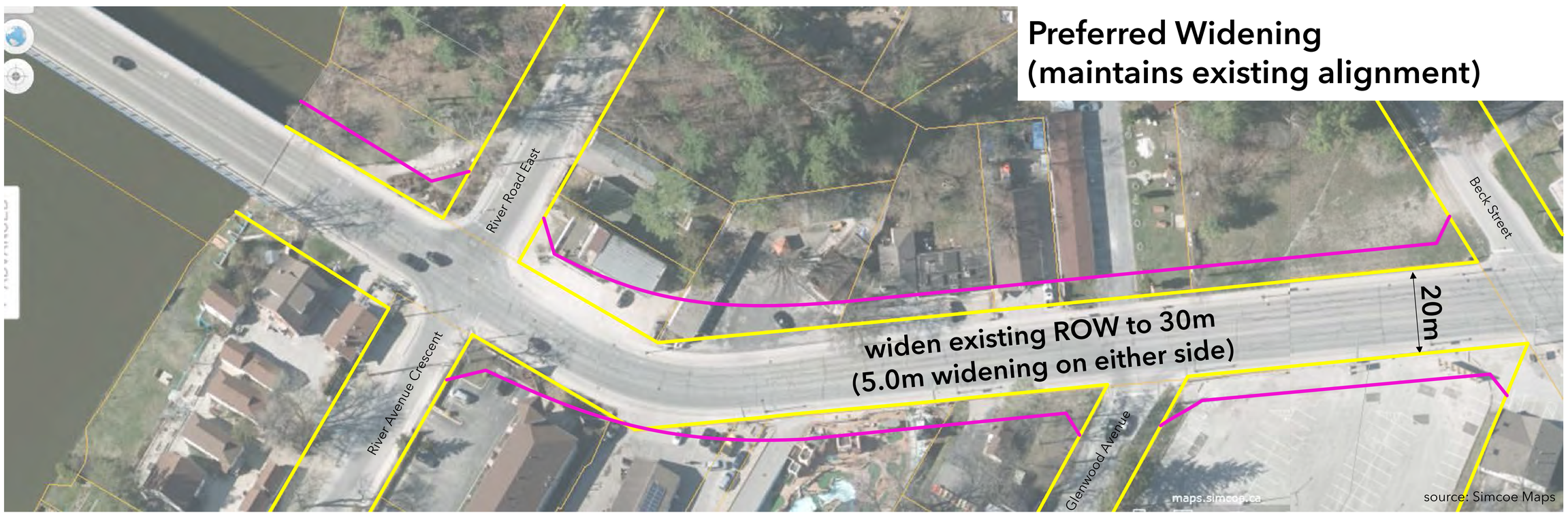


Note: the need for and type of shoreline protection to be confirmed; minimum right-of-way to be confirmed

Main Street and Beach Areas 1 & 2 Improvements

RECAP OF PREFERRED SOLUTIONS

MAIN STREET



EVALUATION OF OPTIONS

River Road West to Beck Street

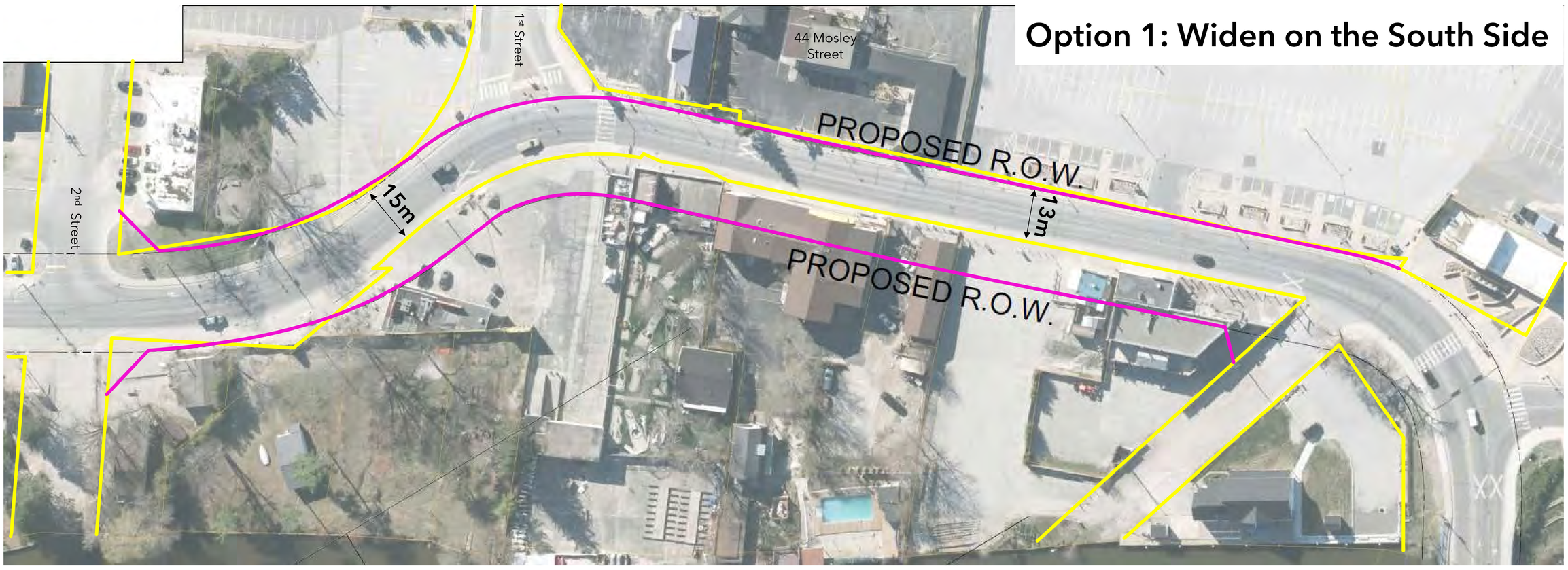
Existing right-of-way is 30 metres (or greater) and thus no additional widening is required.

Beck Street to the River

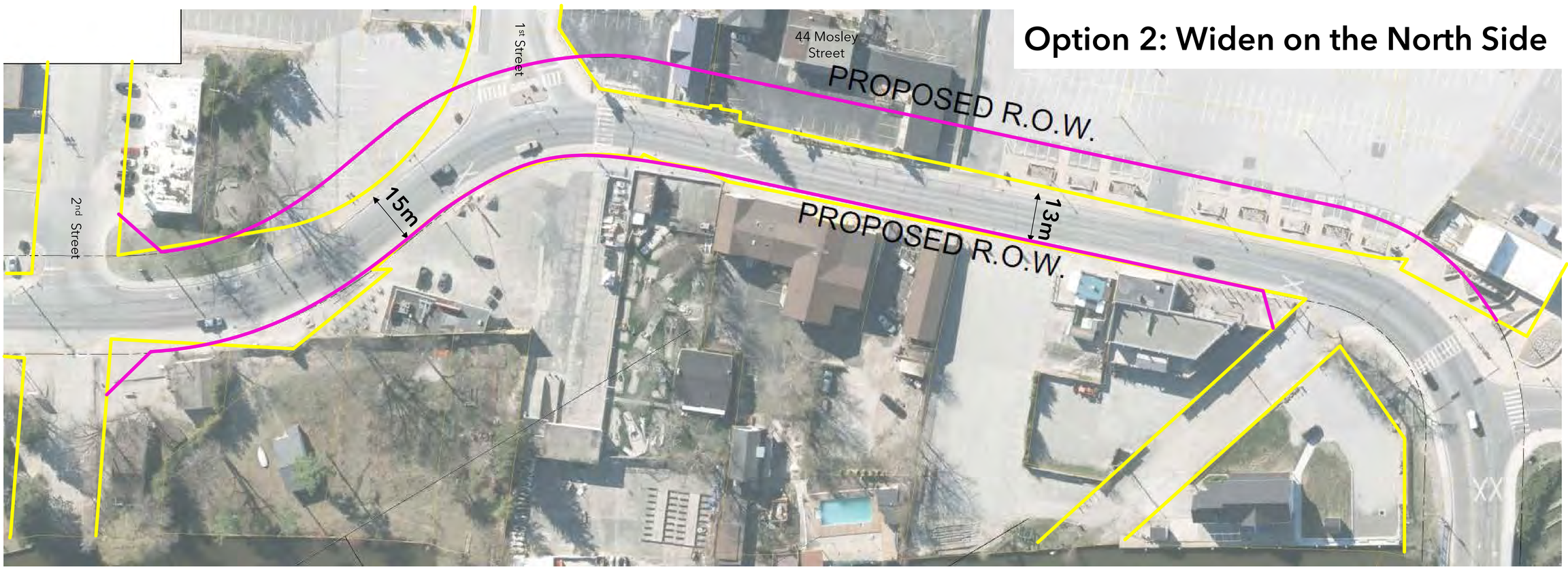
The preferred option is to widen 5.0 metres on both sides, matching the existing 30 metre ROW to the east of Beck Street. This is consistent with the Town's Official Plan and Community Improvement Program policies in place.

MOSLEY STREET – Spruce Street to 2nd Street

Option 1: Widen on the South Side

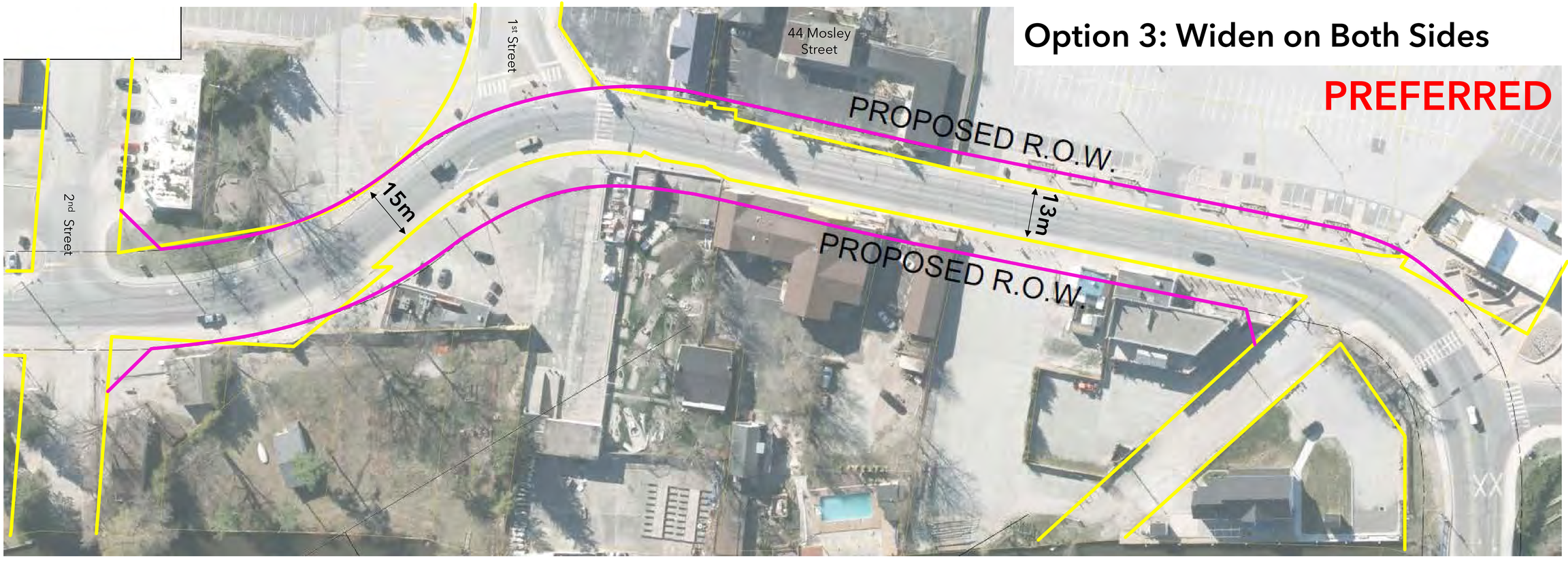


Option 2: Widen on the North Side



Option 3: Widen on Both Sides

PREFERRED



source: Simcoe Maps

existing right-of-way

proposed 23m right-of-way

TOWN OF WASAGA BEACH INCORPORATED 1974

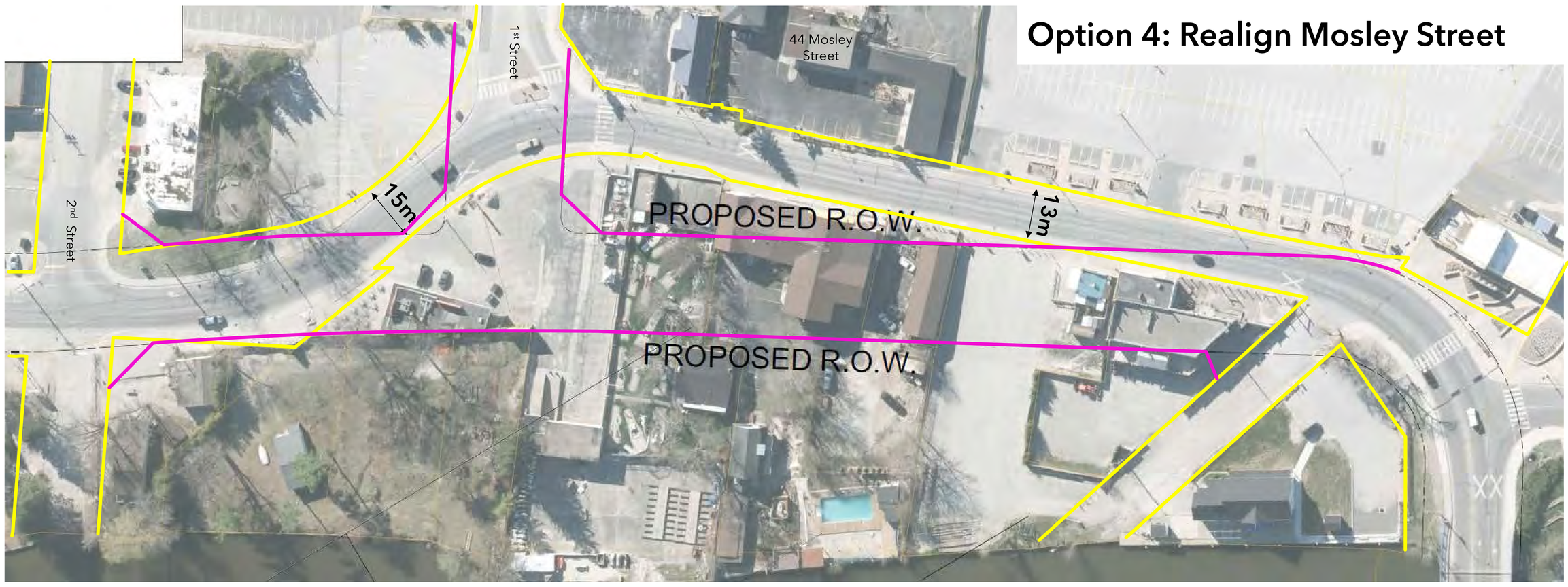
Main Street and Beach Areas 1 & 2 Improvements

ROAD ALIGNMENT & WIDENING

TATHAM ENGINEERING

ENVISIONTATHAM

MOSLEY STREET – Spruce St to 2nd Street (cont'd)



MOSLEY STREET – 2nd Street to 6th Street

source: Simcoe Maps

existing right-of-way proposed 23m right-of-way

EVALUATION OF OPTIONS

Spruce Street to 2nd Street

The preferred option to widen Mosley Street to provide a 23m right-of-way is Option 3: Widen on Both Sides

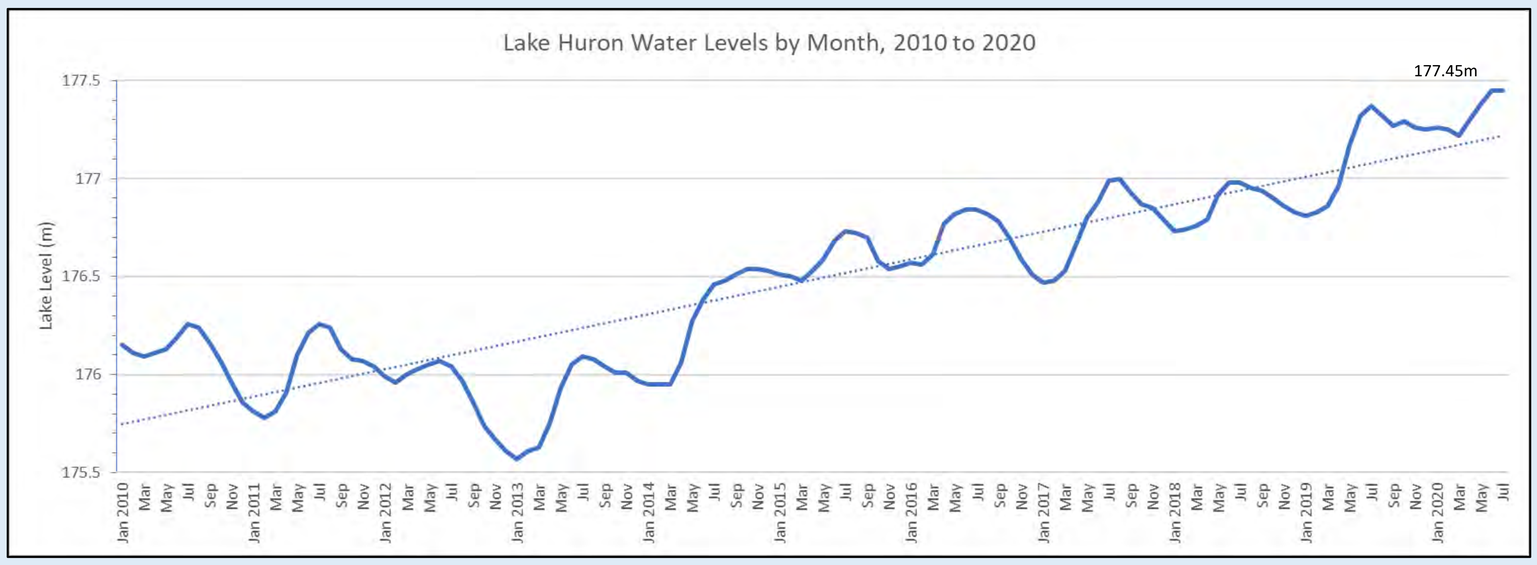
- attempts to balance the impacts to development lands and redevelopment potential on both sides of the road
- Options 1 and 4 have increased impacts to the south side and hence hinder development/redevelopment potential; Option 2 has increased impacts on the north side

2nd Street to 6th Street

The preferred option to widen Mosley Street is simply to best fit the existing right-of-way, attempting to minimize and balance impacts on both sides.

WATER LEVELS & BEACH AREA

Average water levels in Lake Huron (and hence Georgian Bay) have changed considerably over the past years, with record high levels currently being experienced.

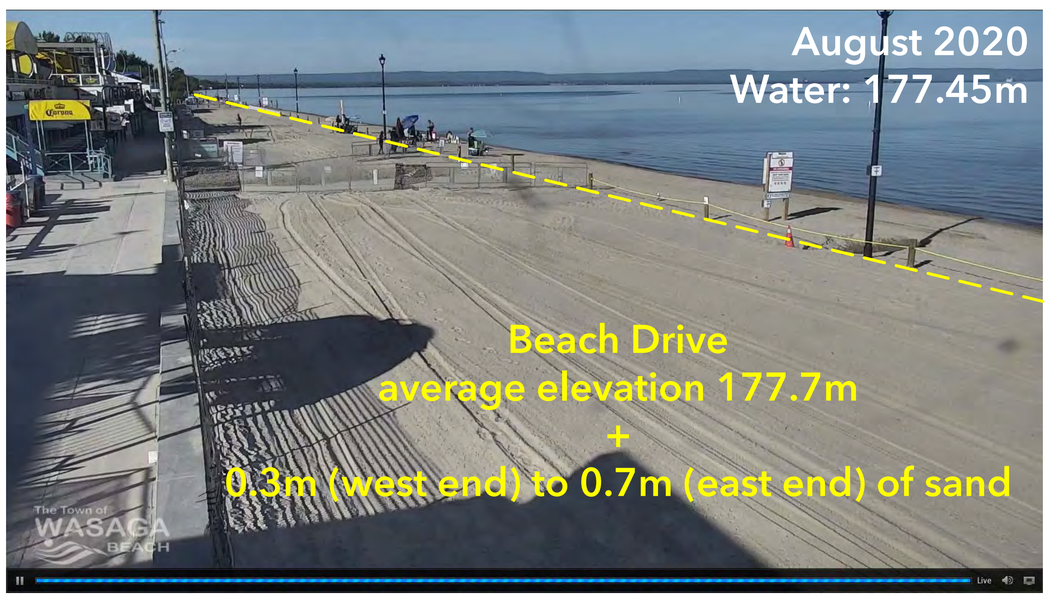


Average water levels as reported by *Fisheries & Oceans Canada* (DFO):

2000: 175.98m **2010: 176.11m** **Jan to Jul 2020: 177.33m**
July 2020: 177.45m

Monthly Mean Water Levels in metres

July 2020	Lake Huron
Mean for Month (preliminary data)	177.45
Mean for month last year	177.37
Mean for month, last 10 years	176.60
Statistics for period of record	1918-2019
Maximum monthly mean / year	177.39 1986
Mean for month, All Time	176.59
Minimum monthly mean / year	175.78 1964
Probable mean for next month	177.43
Chart Datum	176.00



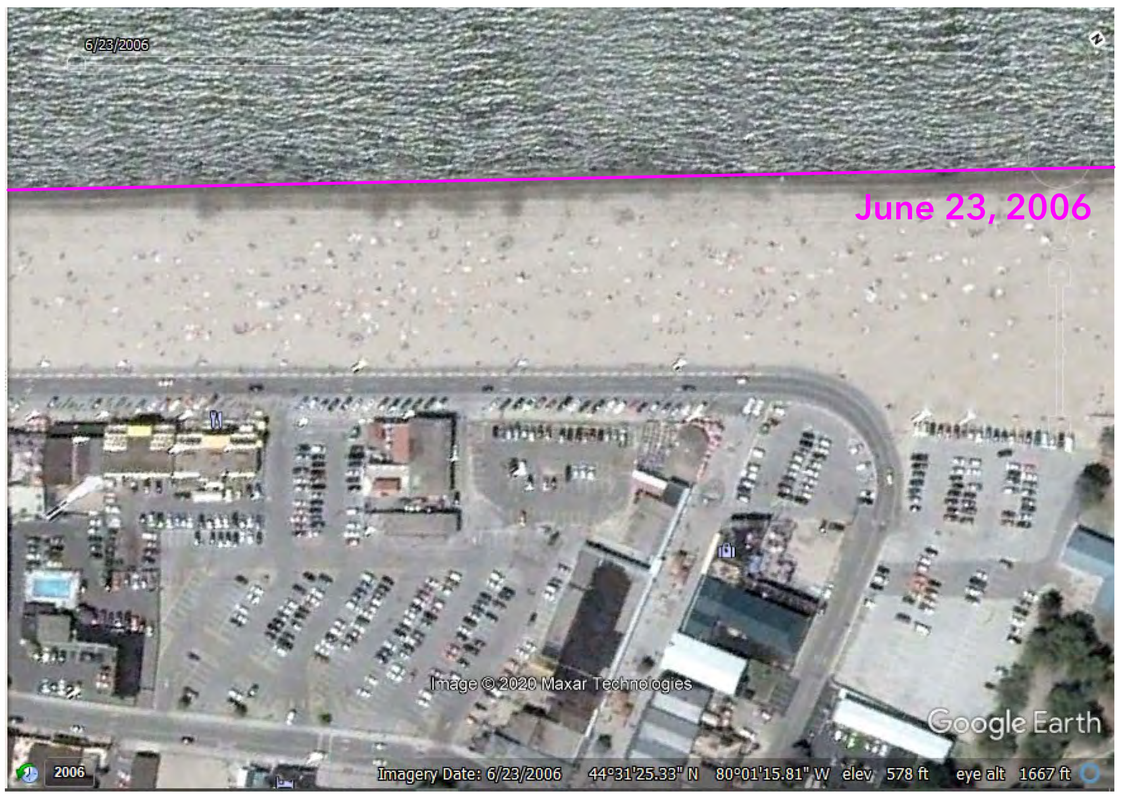
Main Street and Beach Areas 1 & 2 Improvements

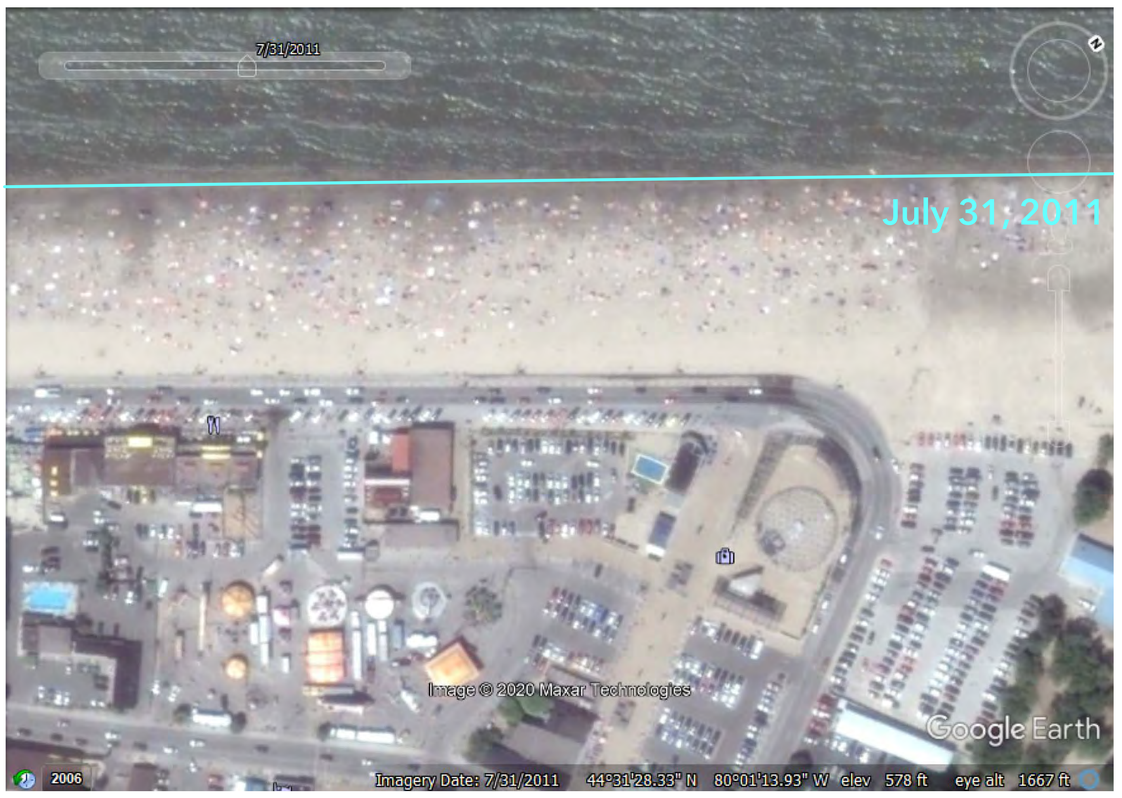
ROAD ALIGNMENT & WIDENING

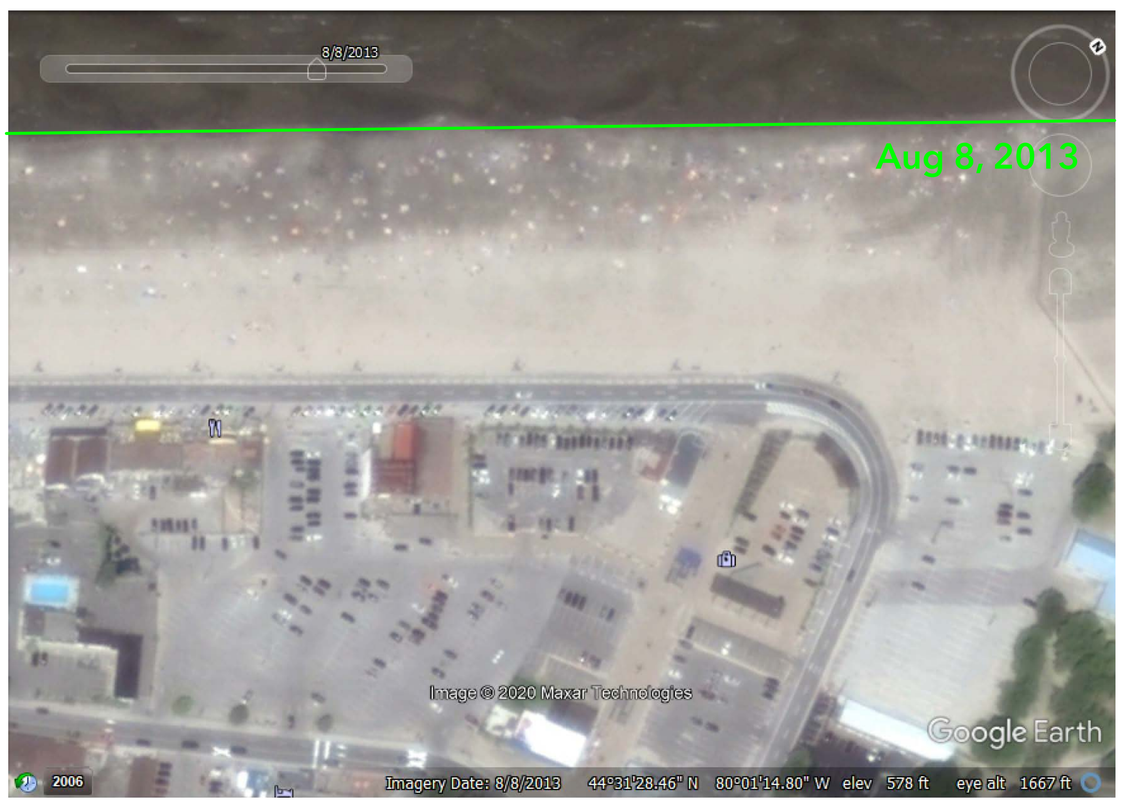
TOWN OF WASAGA BEACH INCORPORATED 1974

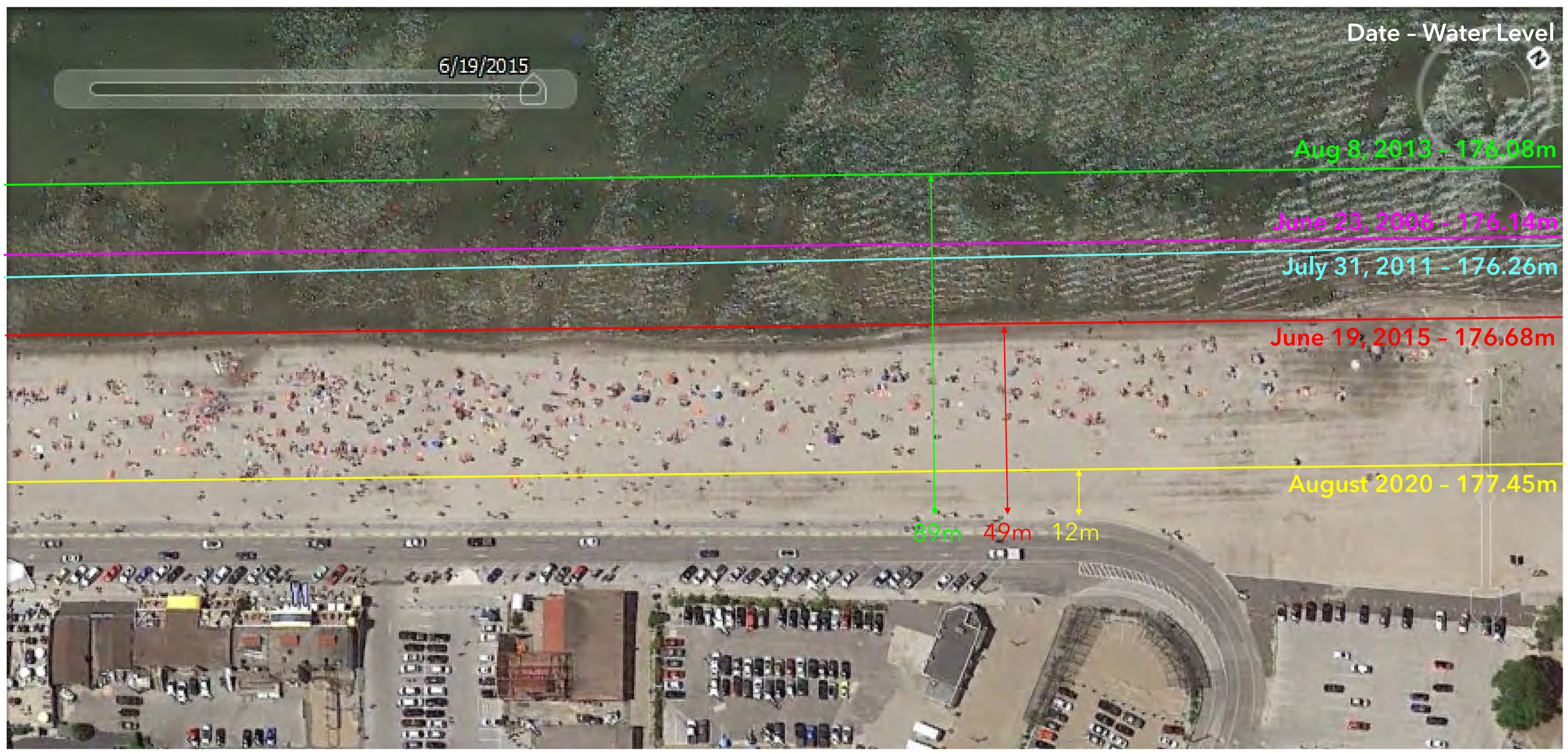
TATHAM ENGINEERING
ENVISIONTATHAM

WATER LEVELS & BEACH AREA









Main Street and Beach Areas 1 & 2 Improvements

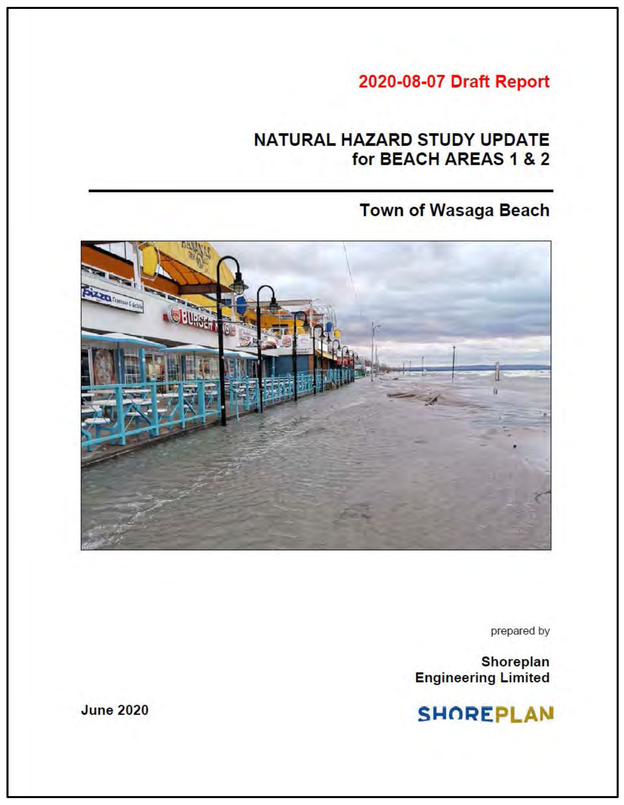
ROAD ALIGNMENT & WIDENING

NATURAL HAZARDS STUDY

To address the impacts of the high water levels on the area and future development potential, a *Natural Hazard Study Update* was completed.

The goals of the study:

- identify the location of the flood hazard areas, erosion hazard areas and dynamic beach hazard areas
- determine appropriate setbacks from these features to facilitate future development Beach 1 & 2 areas


2020-08-07 Draft Report

NATURAL HAZARD STUDY UPDATE
for BEACH AREAS 1 & 2

Town of Wasaga Beach

prepared by

Shoreplan
Engineering Limited

SHOREPLAN

June 2020

100-Year Flood Level

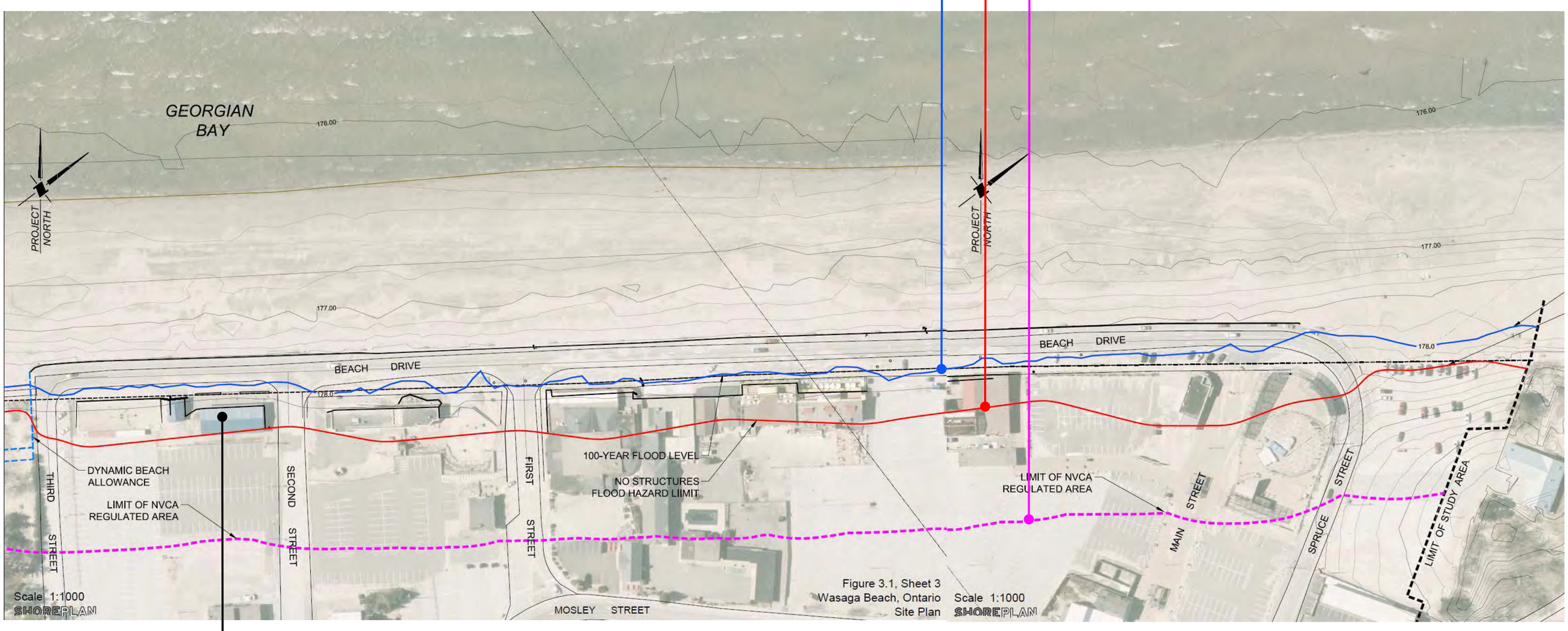
- the water level having a 1% probability of occurrence in any given year

No Structures Flood Hazard

- 100-year storm + consideration for wave uprush
- development beyond this limit is outside the flood hazard and hence would not require floodproofing

NVCA Regulated Area

- guards against the risks associated with natural hazards
- 15m beyond limit of natural hazards



Developing in the Flood Hazard Area

- development within the flood hazard area is permitted if specific conditions are met, including compliance with flood-proofing and access standards
- new development could be allowed within the flood hazard area if these standards are met with designs completed by a qualified professional engineer

STUDY FINDINGS / RECOMMENDATIONS

Build a Wall

- constructing a wall along Beach Drive to meet the flood-proofing standard on its own is NOT practical due to the height of the wall that would be required

Raise the Road

- raising the elevation of the Beach Drive as part of the redevelopment would simplify the floodproofing designs
- an increase of ±3m would be necessary to keep the wave uprush below the flood elevation, which is NOT practical
- any increase in road elevation should be done in conjunction with floodproofing

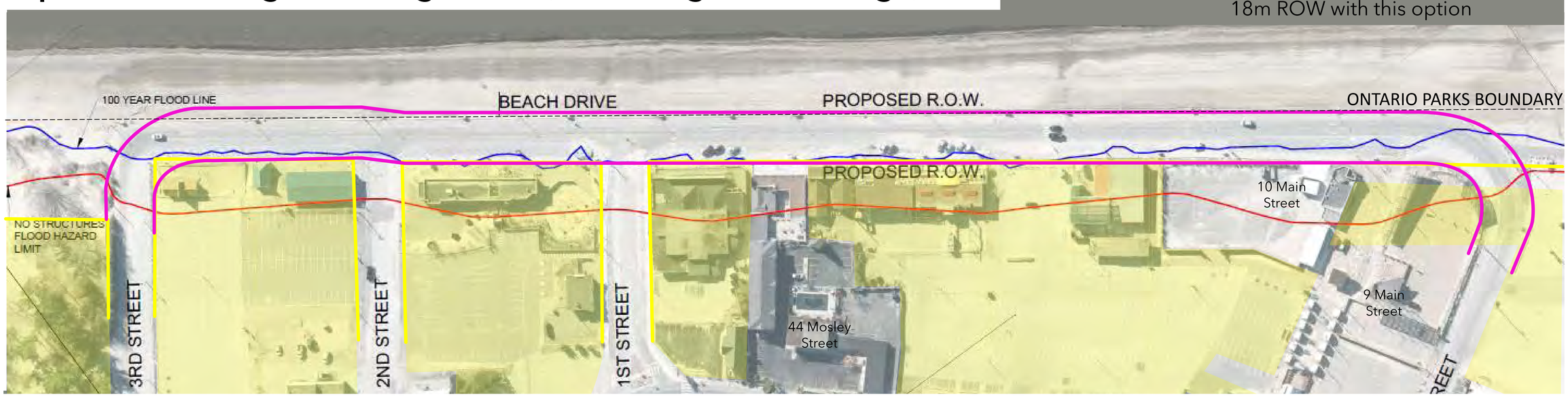
Raise the Road + Revetment

- one option is to raise the road 1.2m (from 177.7m to 178.9m)
- construct revetment / shore protection along the beach
- floodproof to a minimum structural opening of 179.5m (+ 0.6m)

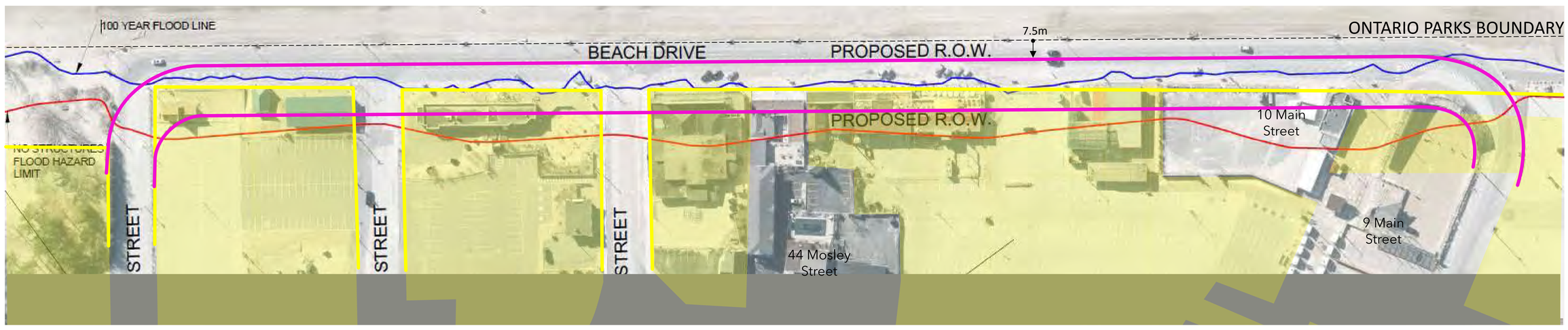
BEACH DRIVE

Option 1: Existing Road Alignment (south edge at buildings)

Note: could also maintain the existing 18m ROW with this option

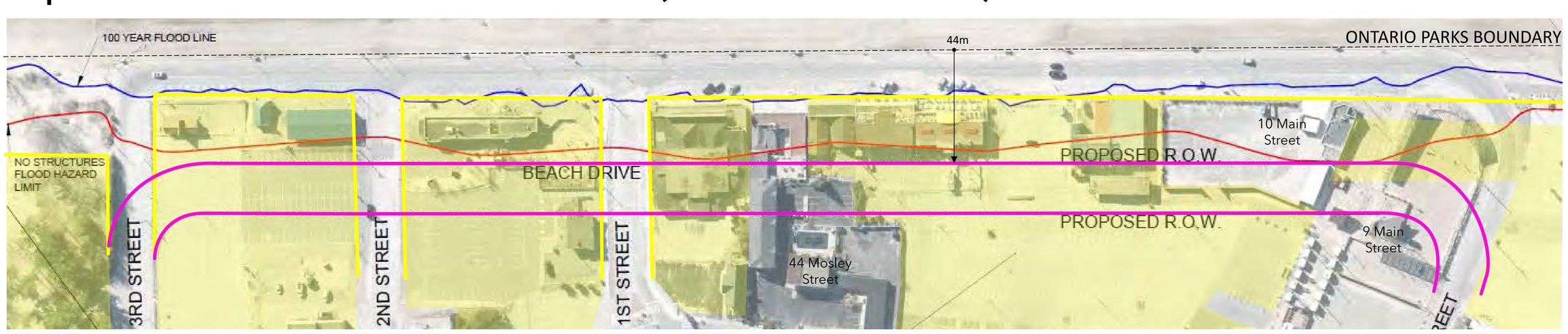


Option 2: Recover Minimum Beach (shift of 7.5 metres south) PREFERRED



Option 3: 100 Year Flood Line (shift of 22 metres south)

Option 4: No Structure Flood Hazard Limit (shift 44 metres south)



existing right-of-way | Town property | proposed 20m right-of-way

EVALUATION OF OPTIONS

The preferred option to provide a 20m right-of-way is Option 2: Recover Minimum Beach

- provides an increased minimum area of beach during high water periods
- maximizes remaining development lands to the south
- ensures existing Ontario Parks boundary can be respected

TOWN OF WASAGA BEACH INCORPORATED 1974

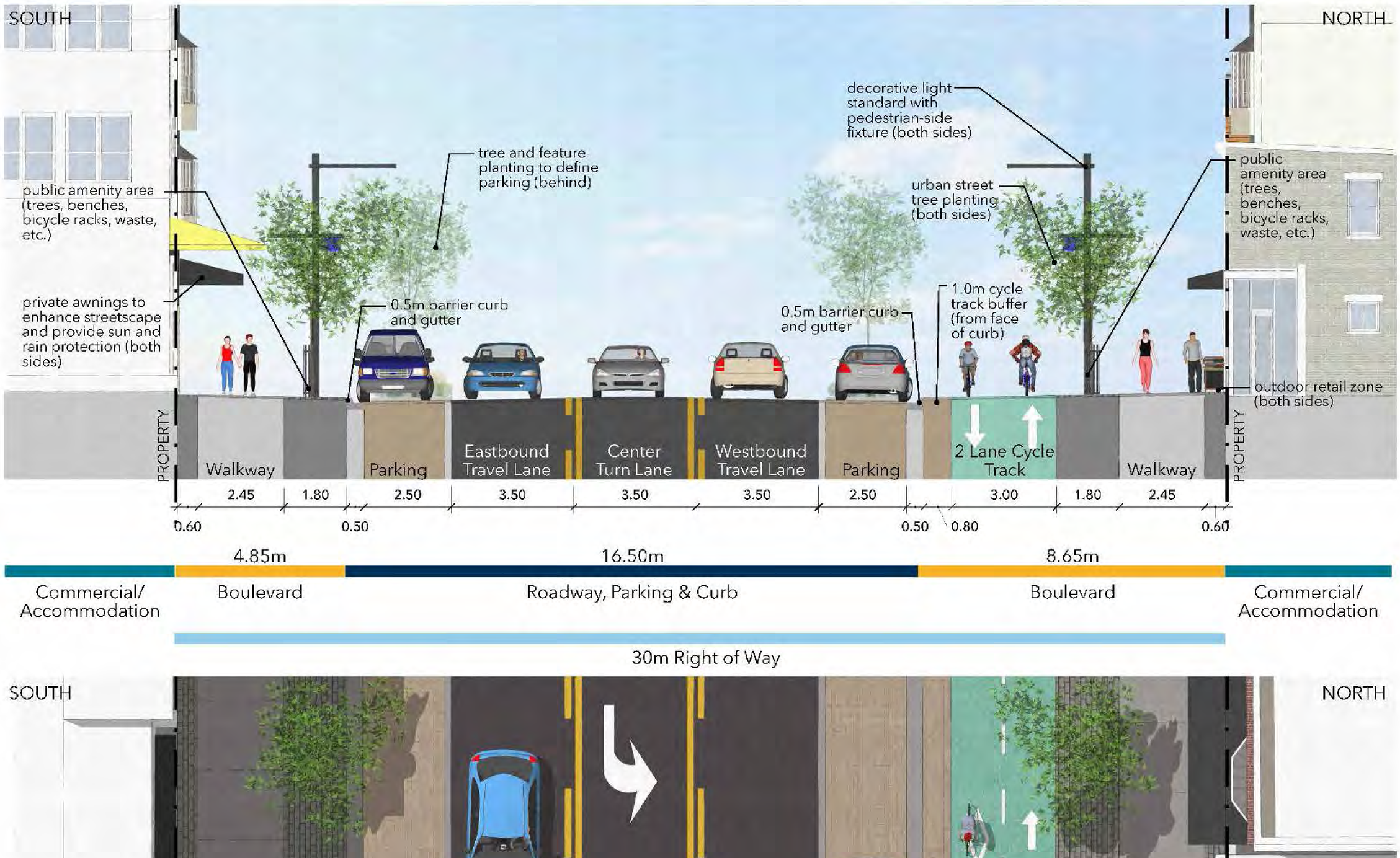
Main Street and Beach Areas 1 & 2 Improvements

ROAD ALIGNMENT & WIDENING

TATHAM ENGINEERING

ENVISIONTATHAM

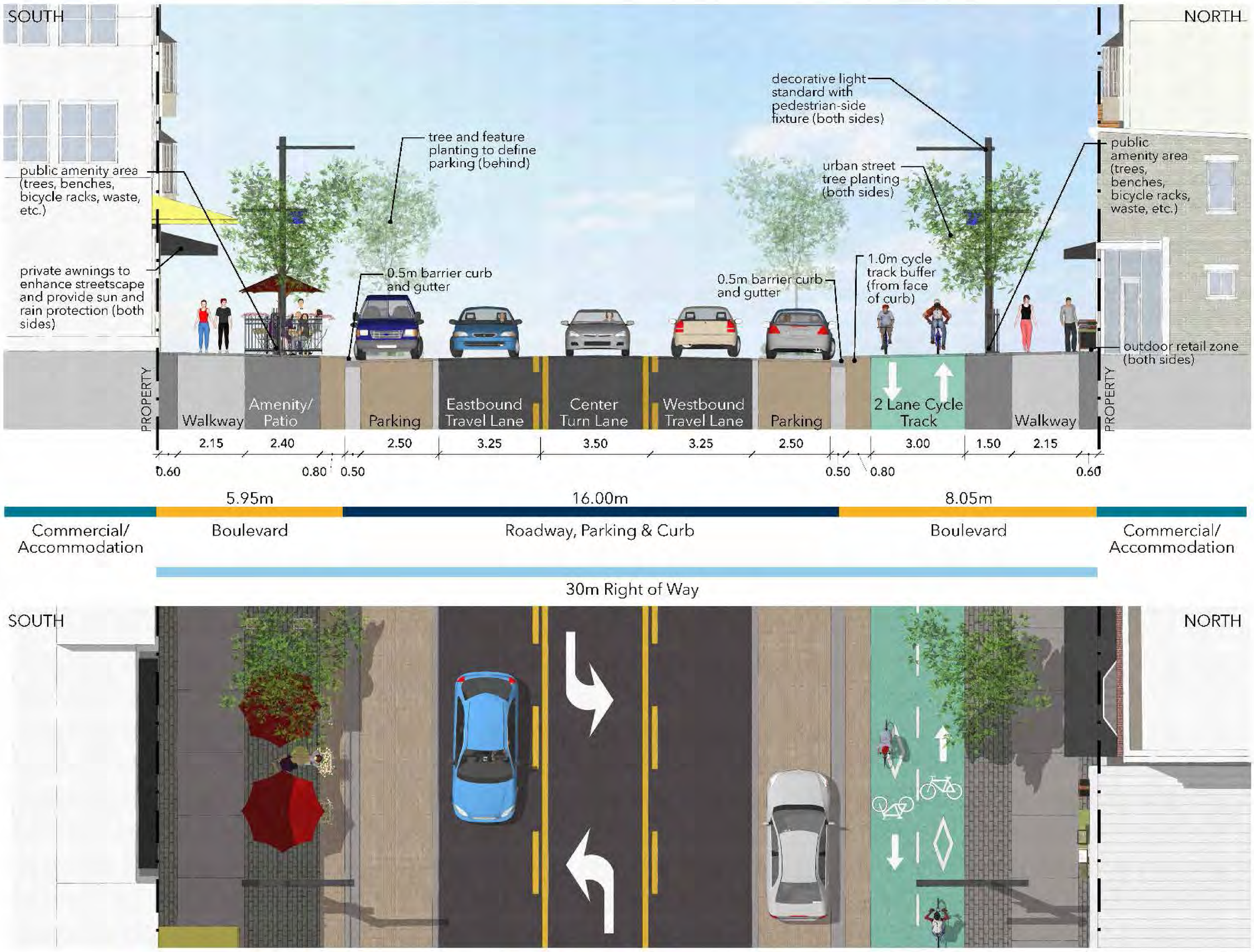
MAIN STREET – Option 1

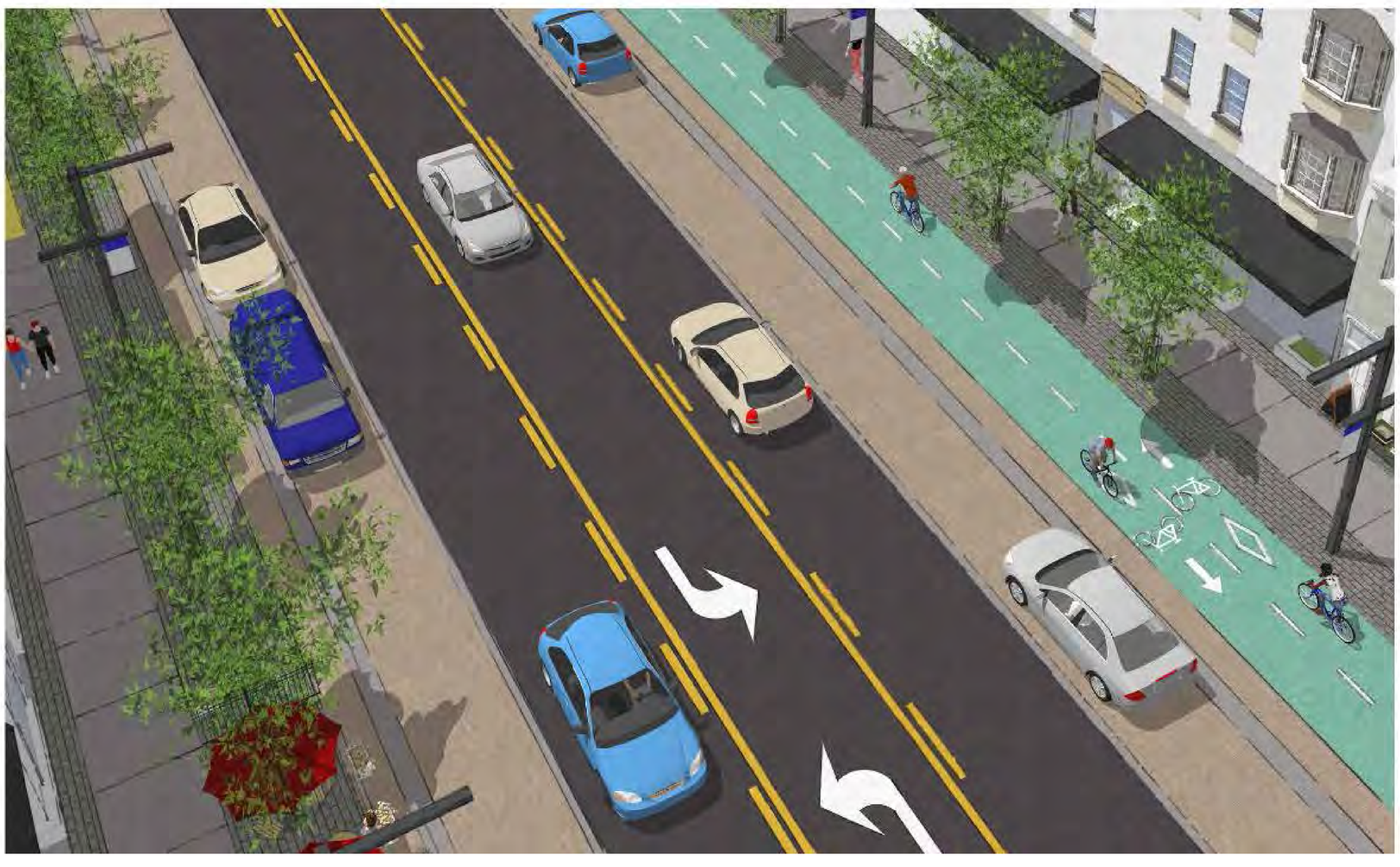


KEY FEATURES

- incorporates 3.5m travel lanes for through and turn lanes (which is considered typical)
- standard 2.5m on-street parking provided on both sides
- 2.45m walkways are provided on both sides of the road
- urban planting provided on both sides
- cycle track of 3.0m (minimum recommended width) provided on the north side to facilitate a connection to Beach Drive
- 1.8m treed amenity zone separates the cycle track from the pedestrian walkway, and a 1.0m buffer is provided to separate the cycle track from the parking lane (to avoid impacts with opening doors)
- intersection and/or mid-block "bump-outs" can be provided to facilitate pedestrian crossings

MAIN STREET – Option 2





KEY FEATURES

- travel lanes are reduced from 3.5 to 3.25m to help reduce travel speeds; centre turn lane maintained at 3.5m given need of turning vehicles
- standard 2.5m on-street parking provided on both sides
- walkways reduced to 2.15m to accommodate provision of an amenity/patio space on south side
- urban plantings on both sides
- cycle track of 3.0m (minimum recommended width) provided on the north side to facilitate a connection to Beach Drive
- 1.5m treed amenity zone separates the cycle track from the pedestrian walkway, and a 1.0m buffer is provided to separate the cycle track from the parking lane (to avoid impacts with opening doors)
- intersection and/or mid-block "bump-outs" can be provided to facilitate pedestrian crossings

TOWN OF WASAGA BEACH INCORPORATED 1974

Main Street and Beach Areas 1 & 2 Improvements

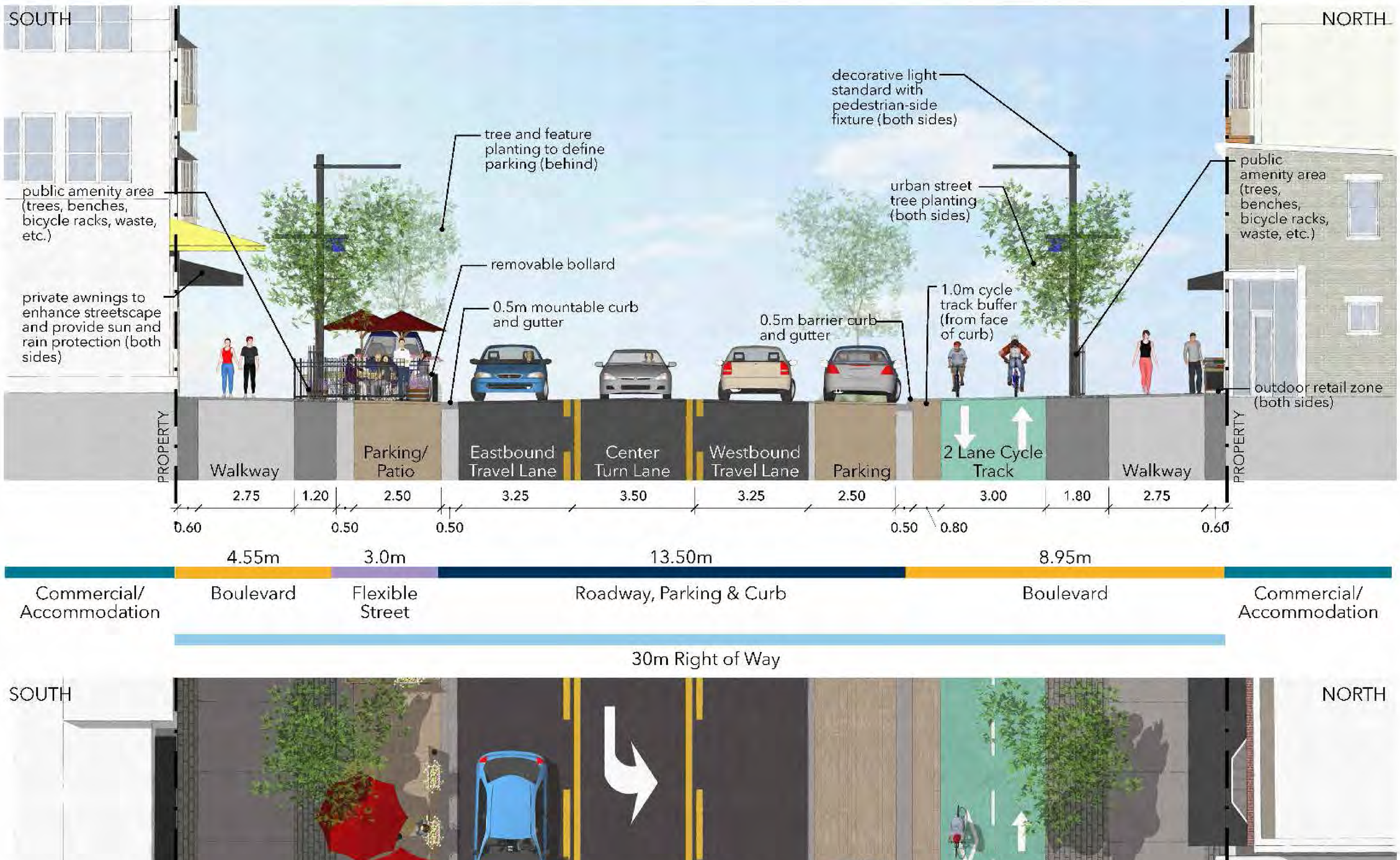
ROAD CROSS-SECTON

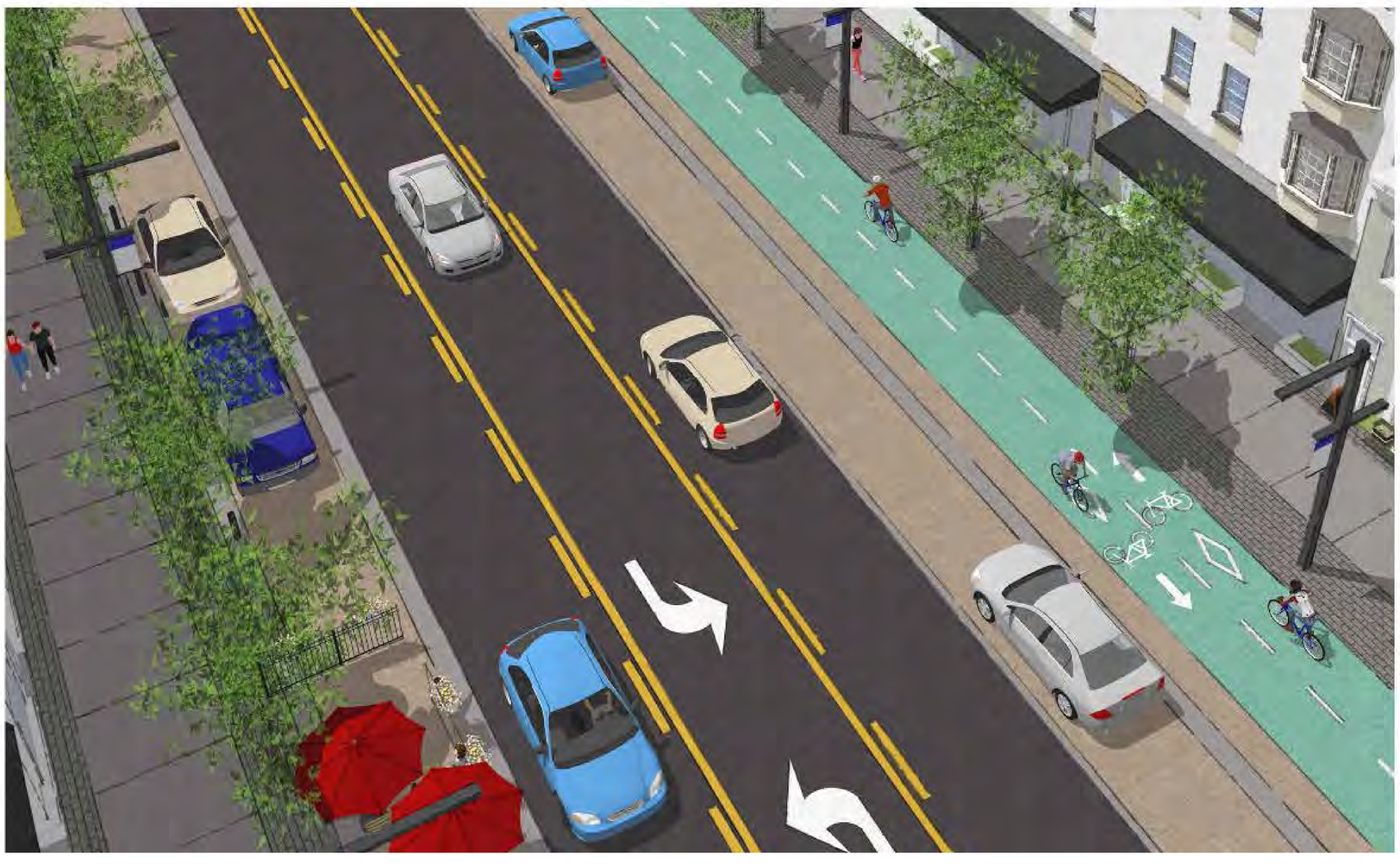
TATHAM ENGINEERING

ENVISIONTATHAM

MAIN STREET – Option 3

PREFERRED





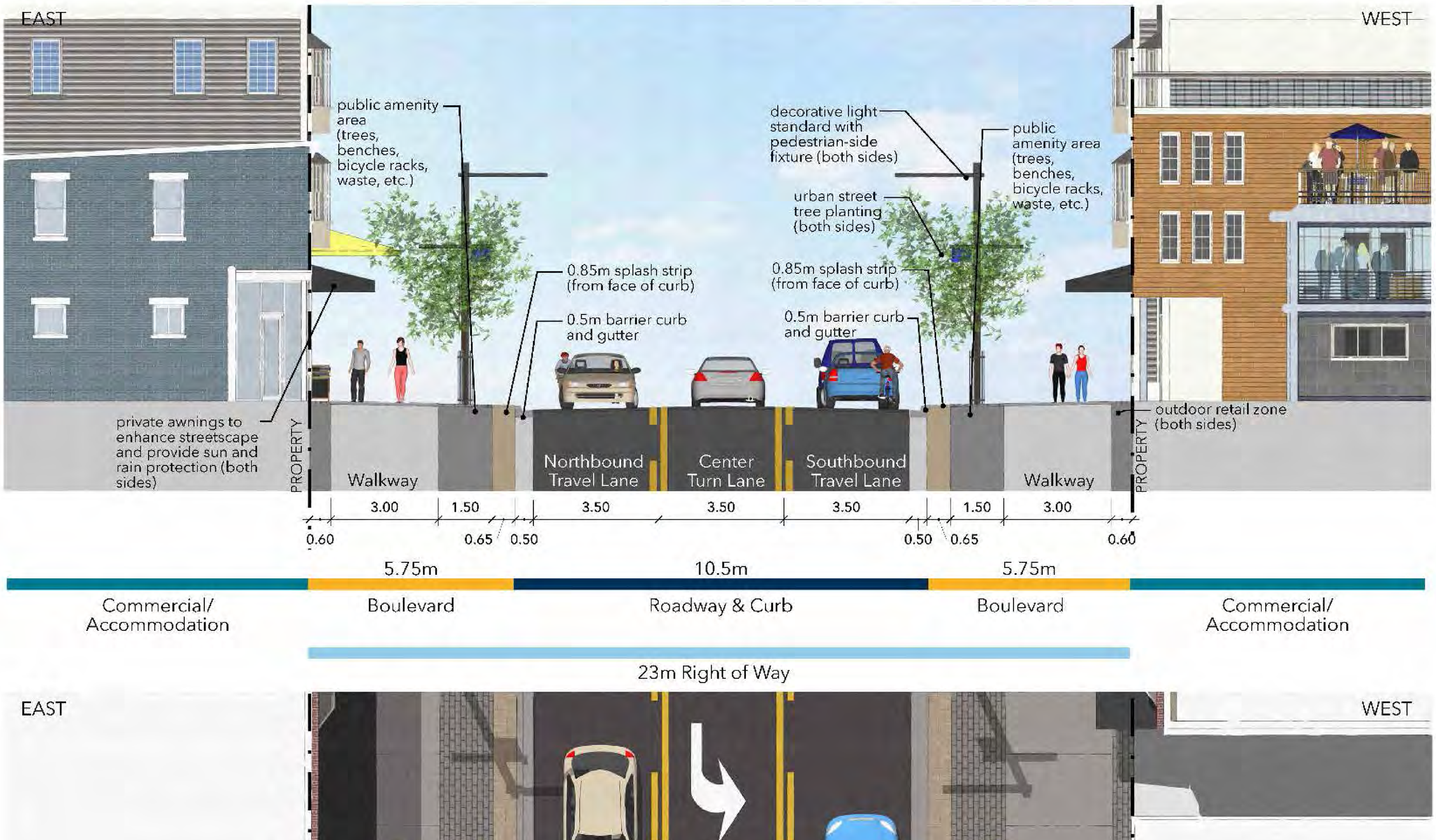
KEY FEATURES

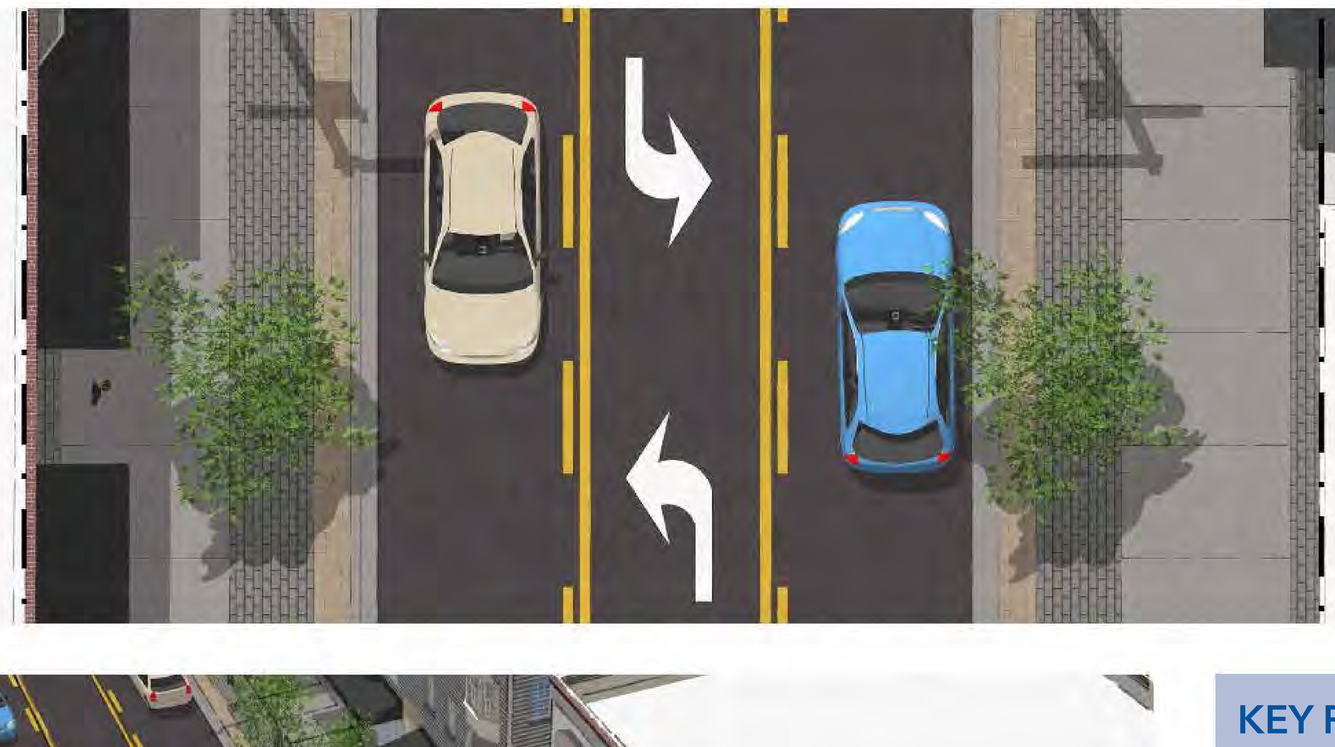
- travel lanes are reduced from 3.5 to 3.25m to help reduce travel speeds; centre turn lane maintained at 3.5m given need of turning vehicles
- standard 2.5m on-street parking provided on north side; flexible parking provided on the south side which can also be used for patio space (via moveable bollards)
- walkways increased to 2.75m
- urban plantings on both sides
- cycle track of 3.0m (min recommended width) provided on the north side to facilitate a connection to Beach Drive
- 1.8m treed amenity zone separates the cycle track from the pedestrian walkway, and a 1.0m buffer is provided to separate the cycle track from the parking lane (to avoid impacts with opening doors)
- intersection and/or mid-block "bump-outs" can be provided to facilitate pedestrian crossings

Main Street and Beach Areas 1 & 2 Improvements

ROAD CROSS-SECTON

MOSLEY STREET – Option 1





KEY FEATURES

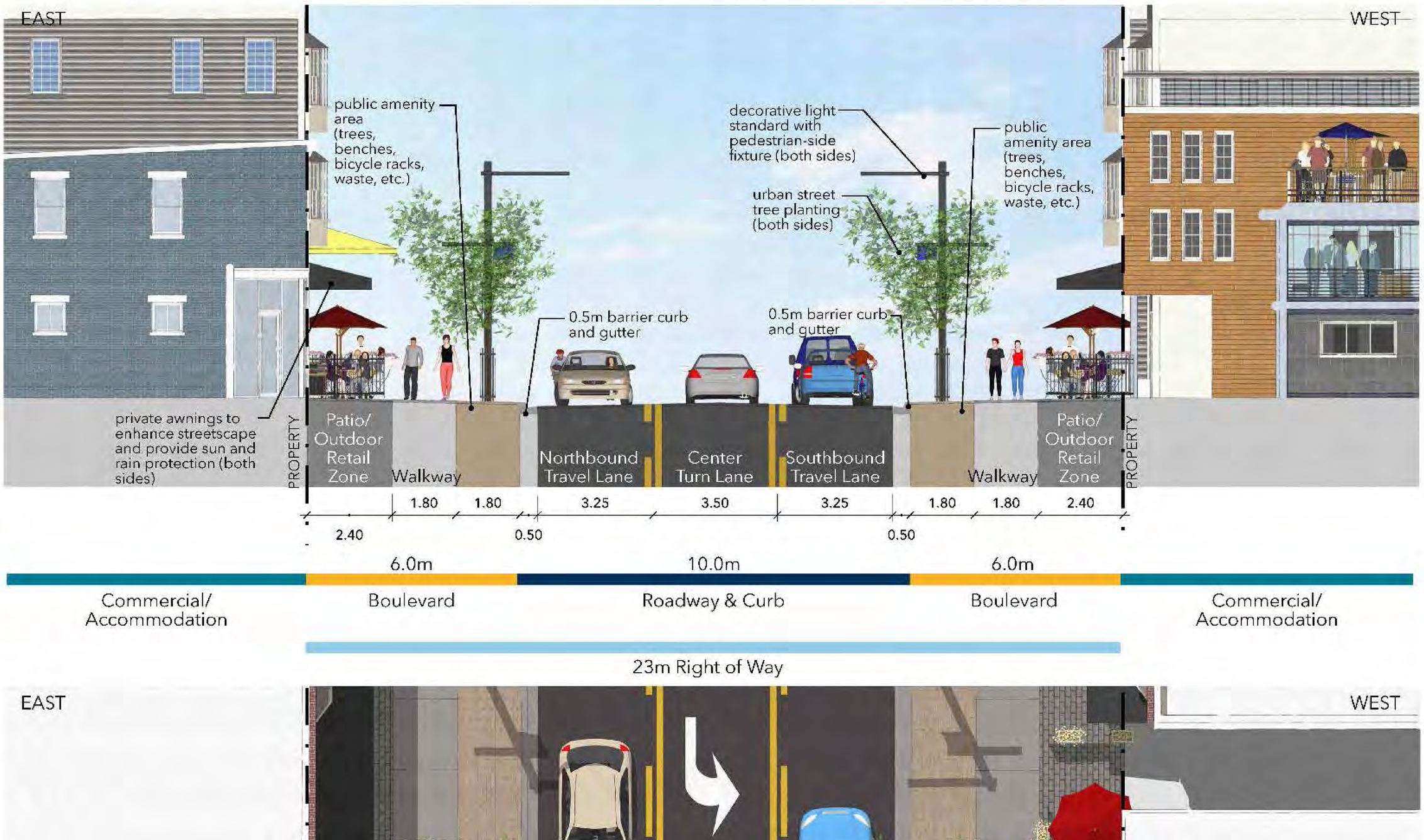
- incorporates 3.5m travel lanes for through and turn lanes (which is considered typical)
- 3.0m walkways are provided on both sides of the road
- the 1.5m amenity area serves as a buffer between the travel lanes and the pedestrian realm

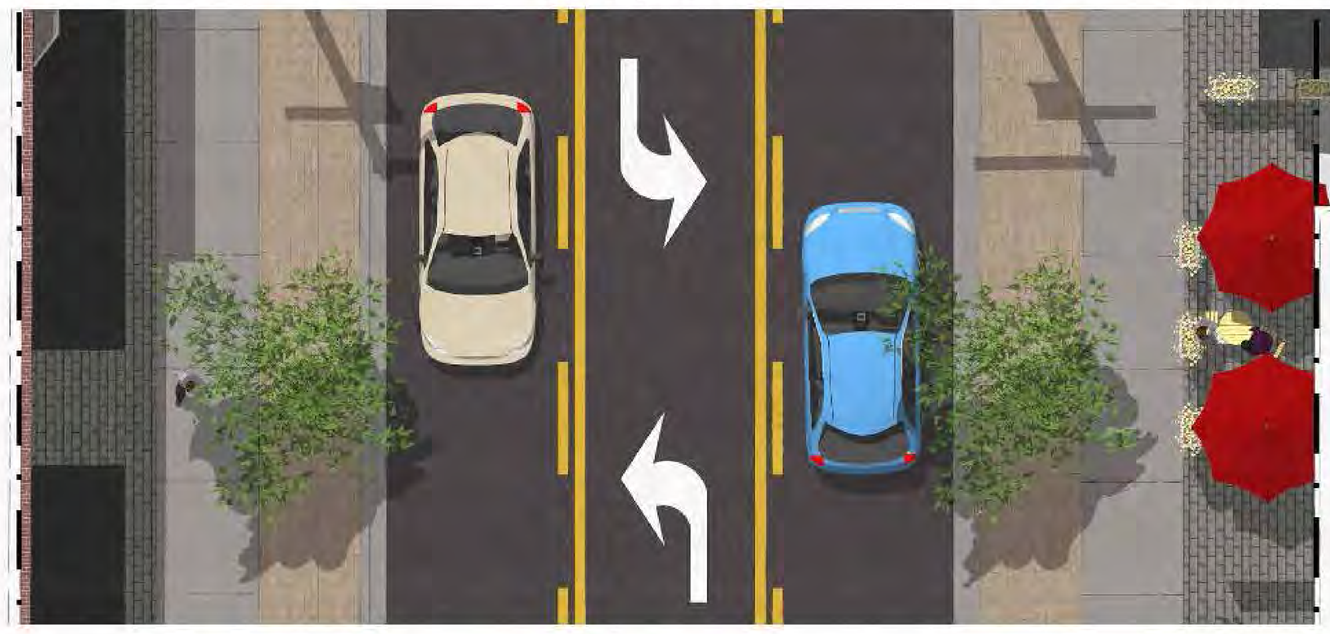
Main Street and Beach Areas 1 & 2 Improvements

ROAD CROSS-SECTON

MOSLEY STREET – Option 2

PREFERRED





KEY FEATURES

- travel lanes are reduced from 3.5 to 3.25m to help reduce travel speeds; centre turn lane maintained at 3.5m given need of turning vehicles
- 6.0m boulevards provided on both sides which accommodate a building-side patio/retail zone, a 1.8m sidewalk and a 1.8m amenity area
- the 1.8m amenity area serves as a buffer between the travel lanes and the pedestrian realm
- pedestrians will have in excess of 4.2m of walking space in normal conditions (where patios are not present)
- the 1.8m+ constraint only occurs where a patio and a tree/light standard are in the same proximity of the street

TOWN OF WASAGA BEACH INCORPORATED 1974

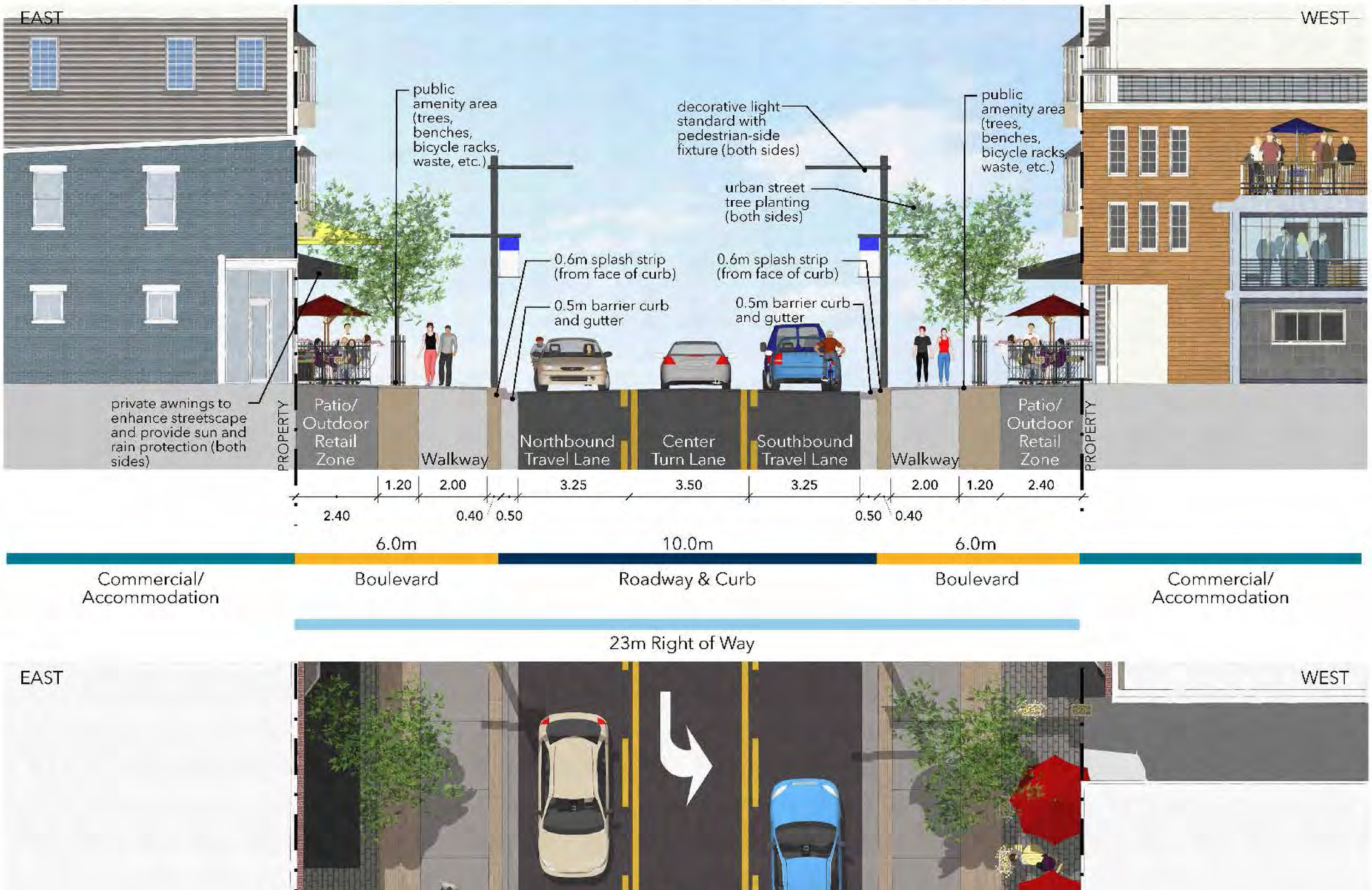
Main Street and Beach Areas 1 & 2 Improvements

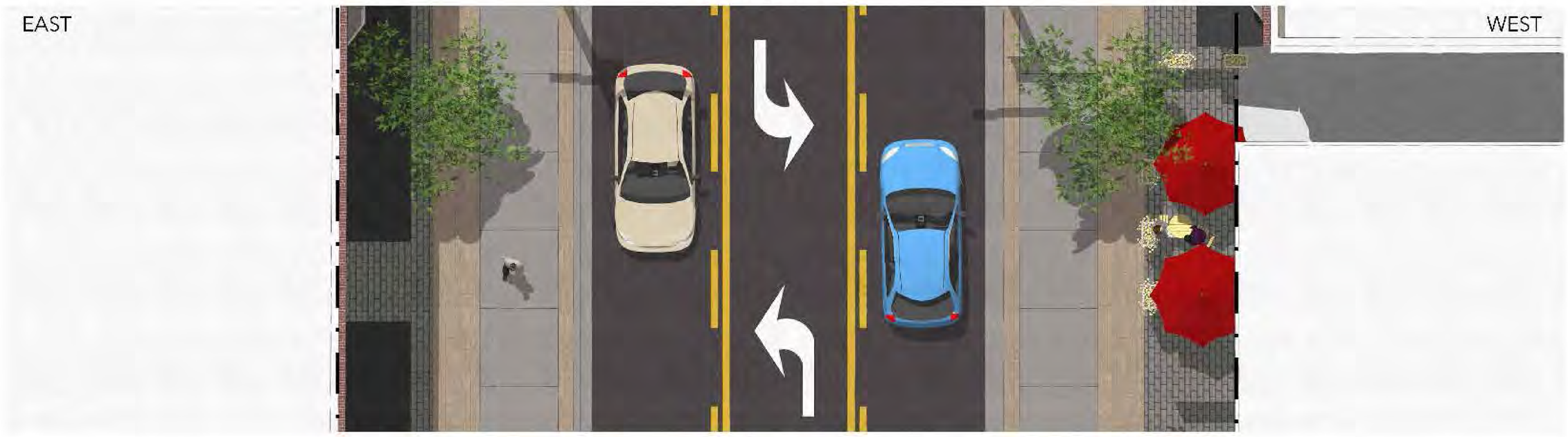
ROAD CROSS-SECTON

TATHAM ENGINEERING

ENVISIONTATHAM

MOSLEY STREET – Option 3





KEY FEATURES

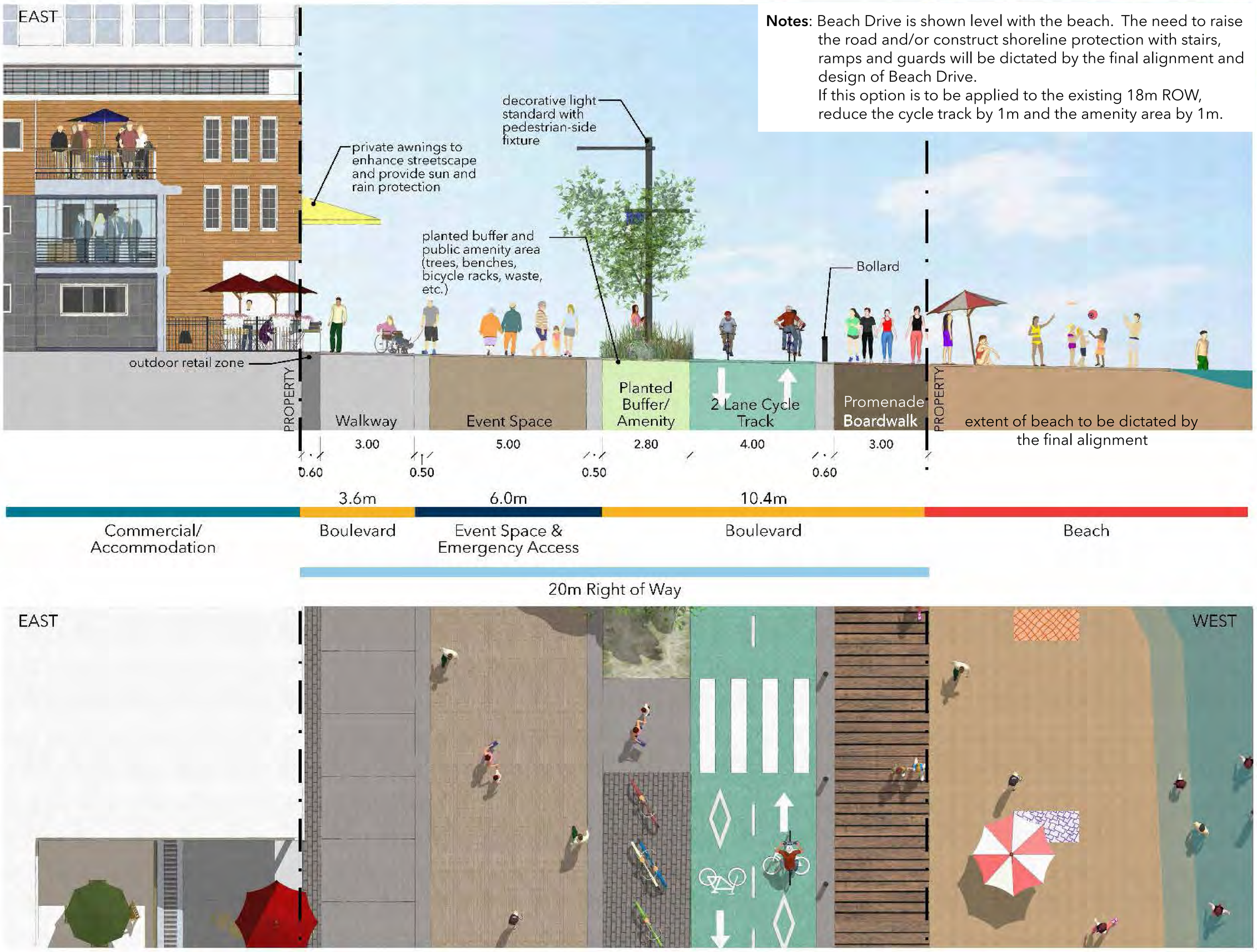
- travel lanes are reduced from 3.5 to 3.25m to help reduce travel speeds; centre turn lane maintained at 3.5m given need of turning vehicles
- 6.0m boulevards provided on both sides which accommodate a building-side patio/retail zone, a centralized tree/amenity zone, and a 2.0m sidewalk with a 0.4m curbside splash strip
- trees are further away from the road
- allows for winter snow storage (as the primary walkway can be moved to the patio zone as a winter condition - defined by sidewalk clearing operations)

Main Street and Beach Areas 1 & 2 Improvements

ROAD CROSS-SECTON

BEACH DRIVE – Option 1

Notes: Beach Drive is shown level with the beach. The need to raise the road and/or construct shoreline protection with stairs, ramps and guards will be dictated by the final alignment and design of Beach Drive.
If this option is to be applied to the existing 18m ROW, reduce the cycle track by 1m and the amenity area by 1m.



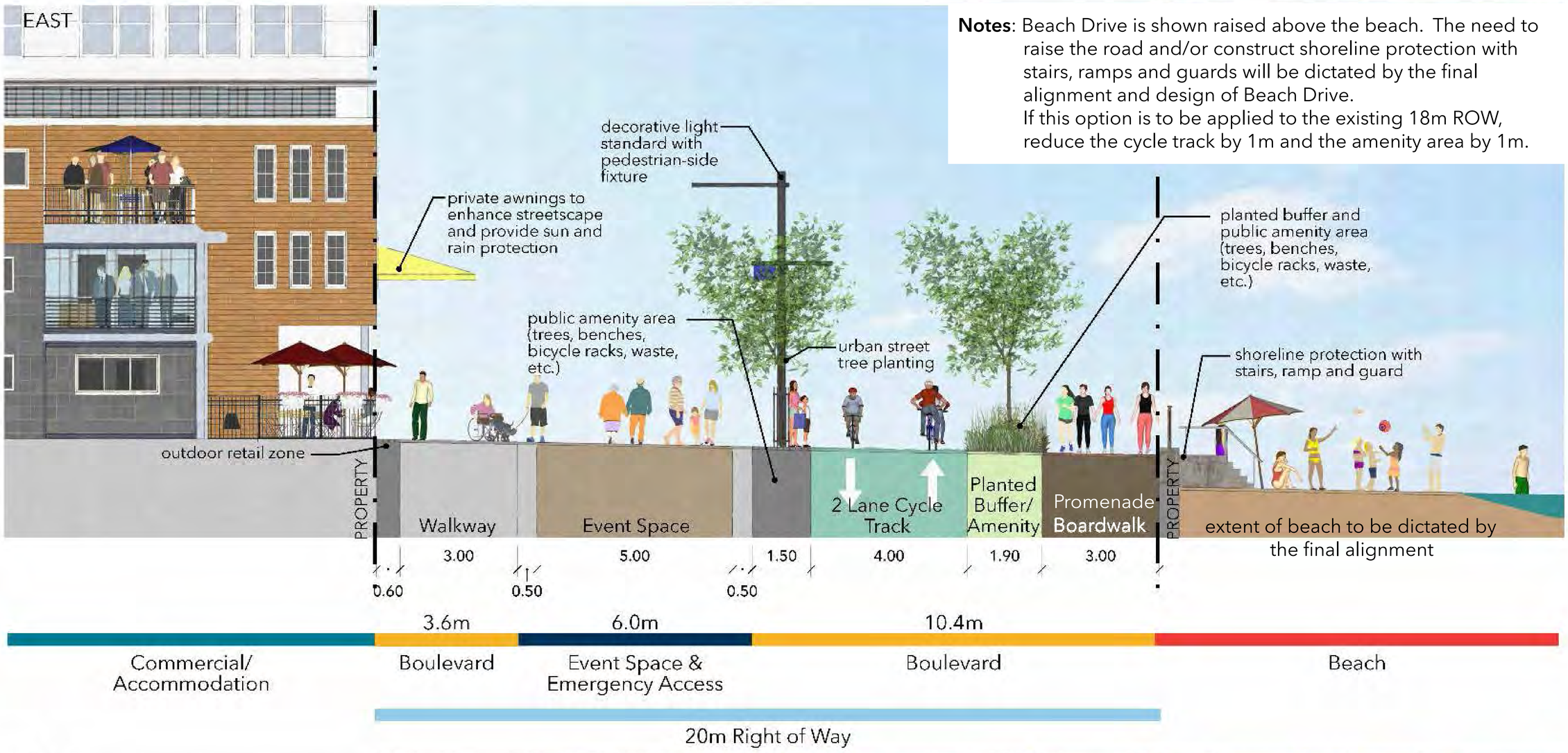
KEY FEATURES

- a generous 3.0m pedestrian walkway and a 0.6m building apron are provided between the buildings and the 6.0m events plaza
- separating the events plaza from the cycle track/boardwalk is a 2.8m naturalized landscape buffer
- buffer to include low-maintenance Georgian Bay shoreline plantings with trees, benches and other public amenities for both the events plaza and bikeway/boardwalk
- the big advantage is that the buffer is of sufficient width such that trees could be planted without the need for expensive underground urban tree infrastructure (eg. tree pits)
- a 4.0m cycle track is proposed (widened from 3.0m given the expected higher volume of cyclists along the beach strip) adjacent to the 3.0m boardwalk)

BEACH DRIVE – Option 2

PREFERRED

Notes: Beach Drive is shown raised above the beach. The need to raise the road and/or construct shoreline protection with stairs, ramps and guards will be dictated by the final alignment and design of Beach Drive.
If this option is to be applied to the existing 18m ROW, reduce the cycle track by 1m and the amenity area by 1m.



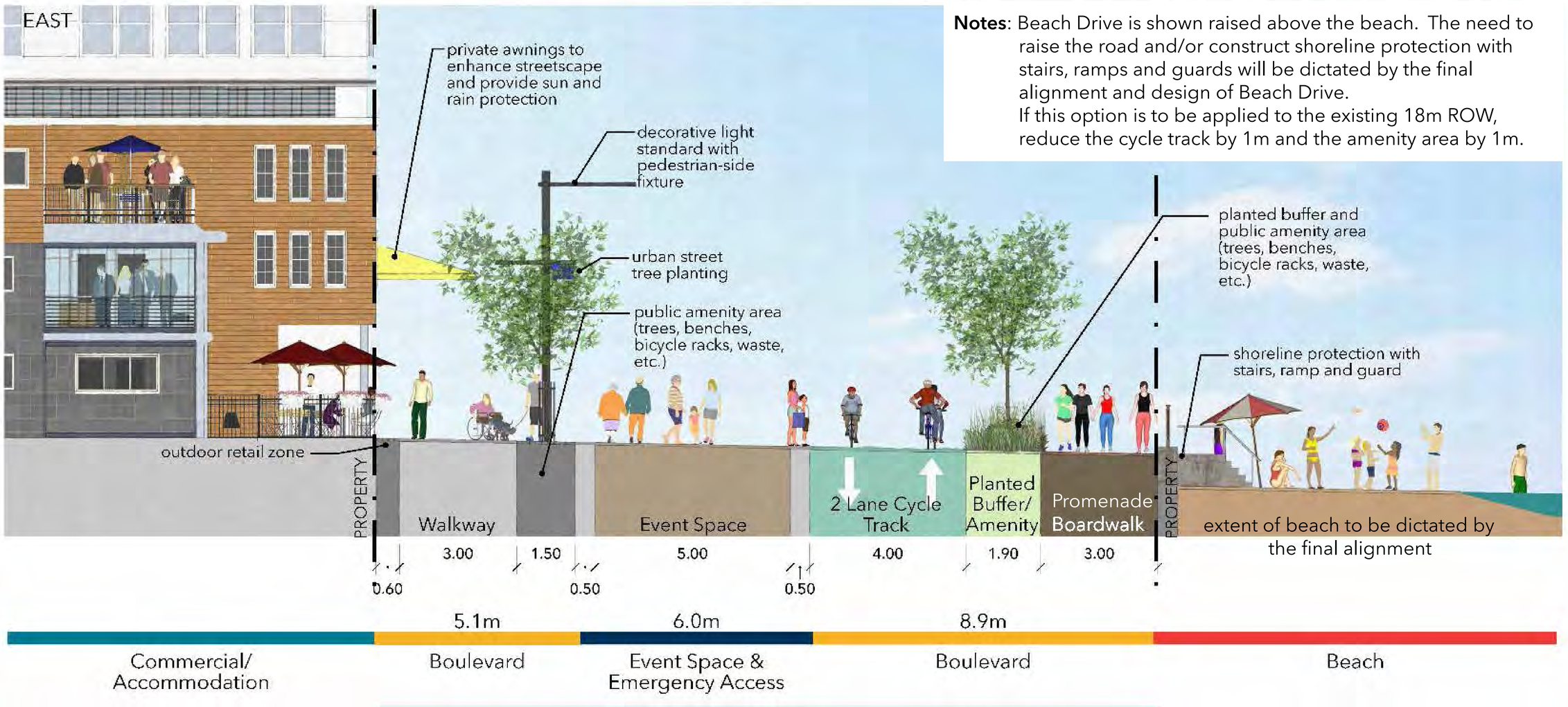
KEY FEATURES

- the pedestrian walkway and events plaza are the same as in Option 1
- the events plaza is separated from the cycle track by an urban tree planting/public amenity strip, which should be supported by urban tree planting infrastructure (eg. Soil Cells)
- the amenity area delineate the cycle from the track/events plaza while still providing access, and could include bike racks, benches and other features (during events, this area could accommodate pedestrians)
- similar to Option 1, the 4.0m cycle track is separated from the 3.0m boardwalk by a 1.9m naturalized landscape buffer
- the boardwalk is raised above the beach and is accessed by stairs/ ramps at controlled points (but could also be level with the beach depending on the final location/ relation with the beach)

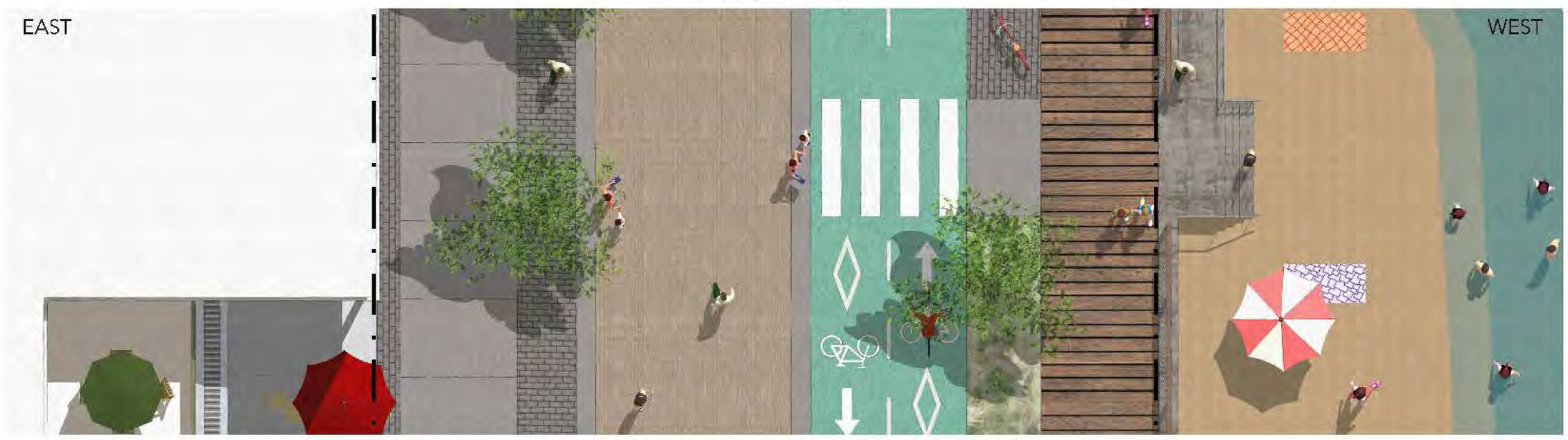
Main Street and Beach Areas 1 & 2 Improvements

ROAD CROSS-SECTON

BEACH DRIVE – Option 3



Notes: Beach Drive is shown raised above the beach. The need to raise the road and/or construct shoreline protection with stairs, ramps and guards will be dictated by the final alignment and design of Beach Drive.
If this option is to be applied to the existing 18m ROW, reduce the cycle track by 1m and the amenity area by 1m.



KEY FEATURES

- as a variation of Option 2, the urban tree planting is placed between the 3.0m sidewalk and the events plaza to provide some shade in this area
- it would be hard surfaced between the tree pits and supported by urban tree planting infrastructure (eg Soil Cells)
- on the other side, the events plaza and 4.0m cycle track would be directly adjacent to each other
- like Option 2, the 4.0m cycle track is separated from the 3.0m boardwalk by a 1.9m naturalized landscape buffer
- the boardwalk is raised above the beach and is accessed by stairs/ramps at controlled points (but could also be level with the beach depending on the final location/relation with the beach)

INTERSECTION OPERATIONS

To identify intersection improvements required to accommodate planned growth, operations at the study area intersections were reviewed based on the following:

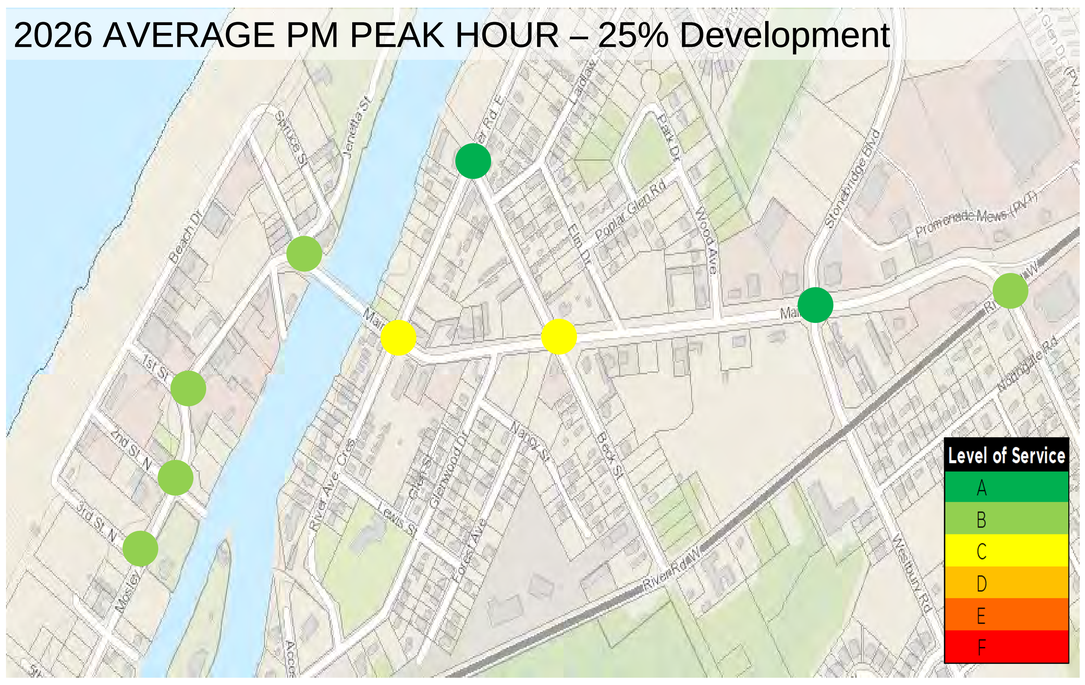
- Projected traffic volumes for 2026, 2031 & 2041
- Proposed 3-lane cross-sections on Main Street and Mosley Street
- Closure of Beach Drive
- Existing intersection control

Closure of Beach Drive

- Volumes on 1st, 2nd, 3rd and Spruce Street have been adjusted to reflect the closure of Beach Drive, as each will predominantly serve as access roads to future development
- The northwesterly terminus of the side streets may require additional property from adjacent development lands to facilitate turning movements of motorists, service vehicles and emergency response vehicles
- 1st Street and Spruce Street have been reconfigured to serve two-way traffic (inbound and outbound)

2026 Average PM Peak Hour

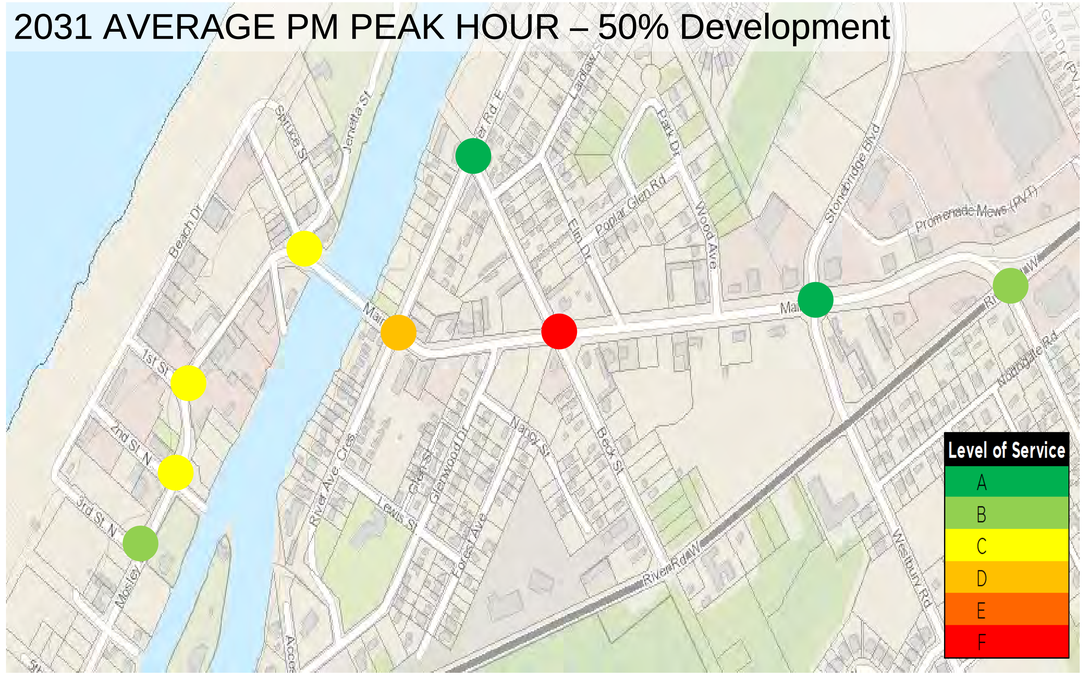
- All intersections provide acceptable operations (Level of Service C or better)
- No intersection improvements are necessary to support 2026 conditions



2031 Average PM Peak Hour

Improvements required to address poor intersection operations at the following intersections

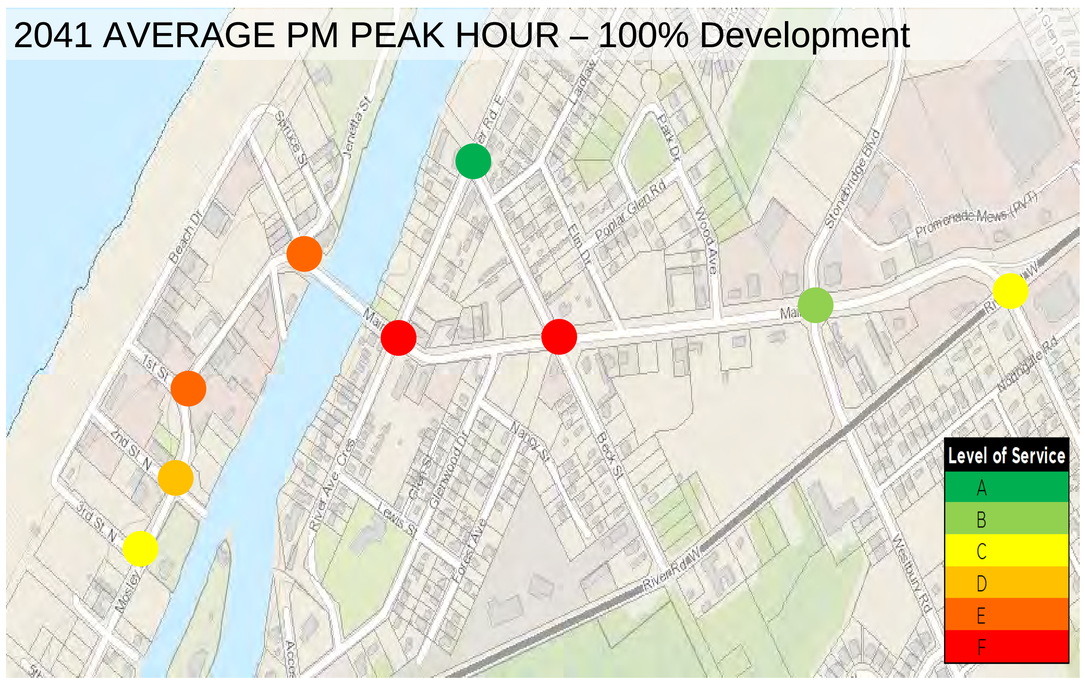
- Beck Street & Main Street
  - Potential improvements:
    - traffic signals
    - roundabout



2041 Average PM Peak Hour

Improvements required to address poor intersection operations at the following intersections

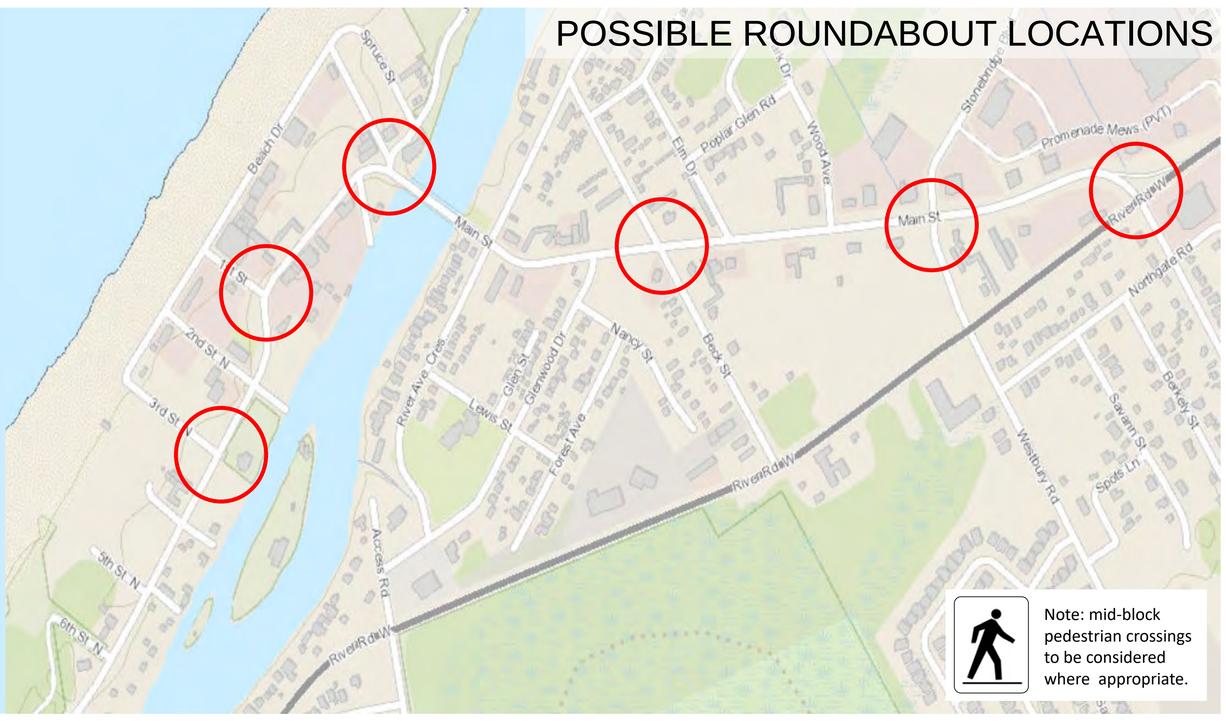
- River Road East/River Crescent Avenue & Main Street
  - Potential improvements
    - traffic signals
    - turn restrictions and/or other improvements
- While still acceptable, operations at the following intersections are approaching poor (LOS E) and may warrant improvements:
  - 1st Street & Mosley Street (traffic signals or roundabout)
  - Spruce Street & Main Street (traffic signals or roundabout)



CONSIDERATION FOR ROUNDABOUT CONTROL

- The feasibility of implementing roundabouts has been reviewed for the following intersections:
  - River Road West & Main Street/Ansley Road
  - Stoneridge Boulevard & Main Street
  - Beck Street & Main Street
  - Spruce Street & Main Street & Mosley Street
  - 1st Street & Mosley Street
  - 3rd Street & Mosley Street
- Assessment has considered single lane roundabouts, with the exception of the River Road West approaches at Main Street

POSSIBLE ROUNDABOUT LOCATIONS

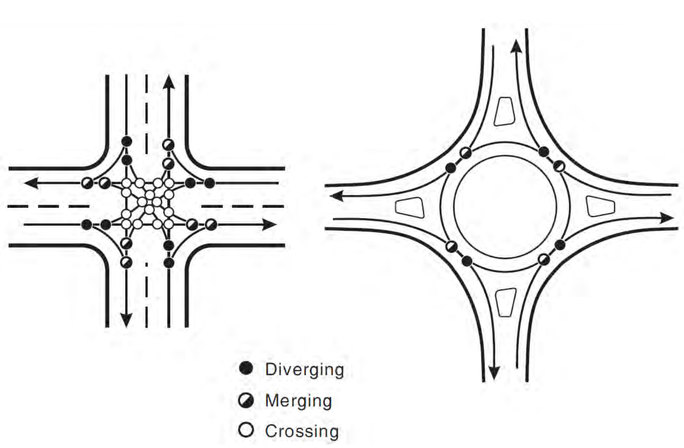


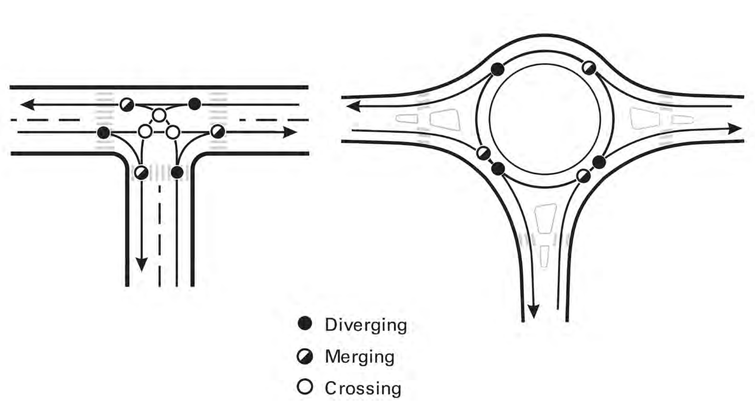
Advantages

- Increased safety
  - significant decrease in severe accidents
  - less conflict points than standard intersection
  - lower speeds (reduces severity of accidents)
- Greater capacity than a signal or all-way stop control intersection operating at the same Level of Service
- Traffic calming effect
- Environmental benefits – reduces stop and go traffic which reduces emissions, fuel consumption and noise
- Aesthetically pleasing (landscaped islands)
- Unaffected by power outages

Disadvantages

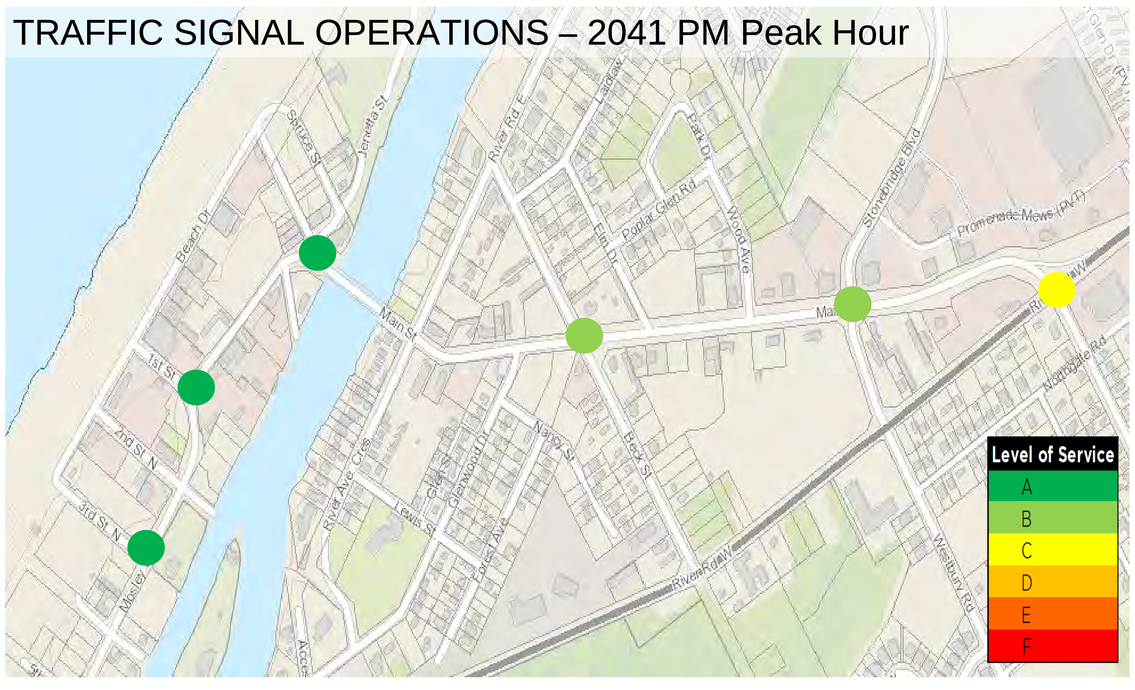
- Land requirements are typically greater than standard intersection
- Difficult for pedestrians to cross – particularly for those with vision impairment
- Can be intimidating for cyclists to navigate
- Dual or multi-lane roundabouts result in increased accidents (albeit non-injury crashes)
- No provision for emergency vehicle priority
- Can disrupt vehicle platoons if placed along a signal coordinated corridor



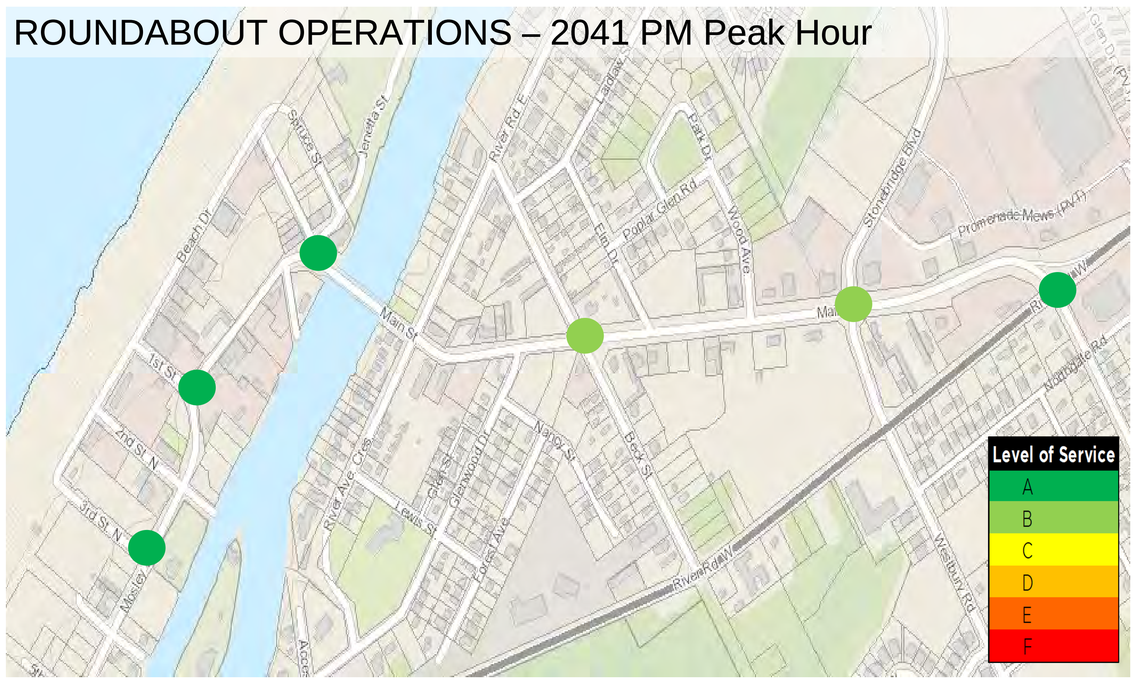


TRAFFIC SIGNAL CONTROL VS ROUNDBOUT CONTROL

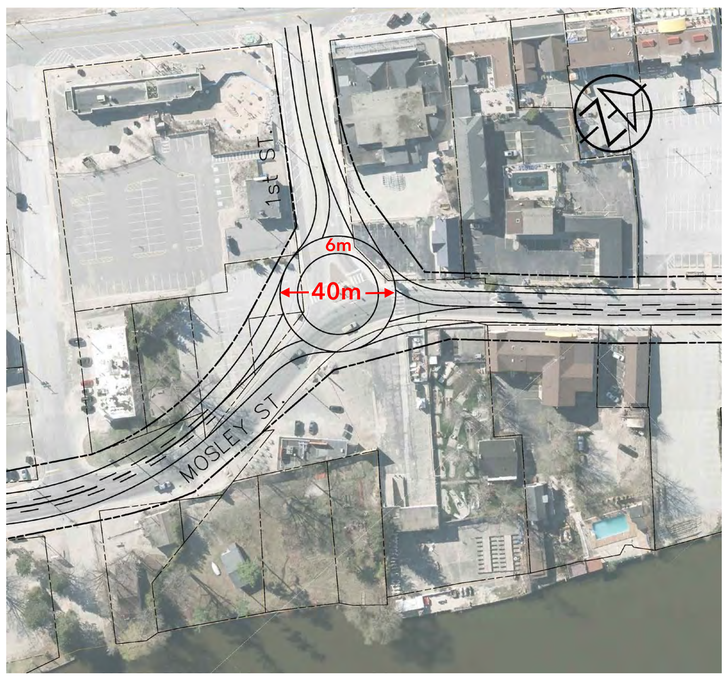
TRAFFIC SIGNAL OPERATIONS – 2041 PM Peak Hour



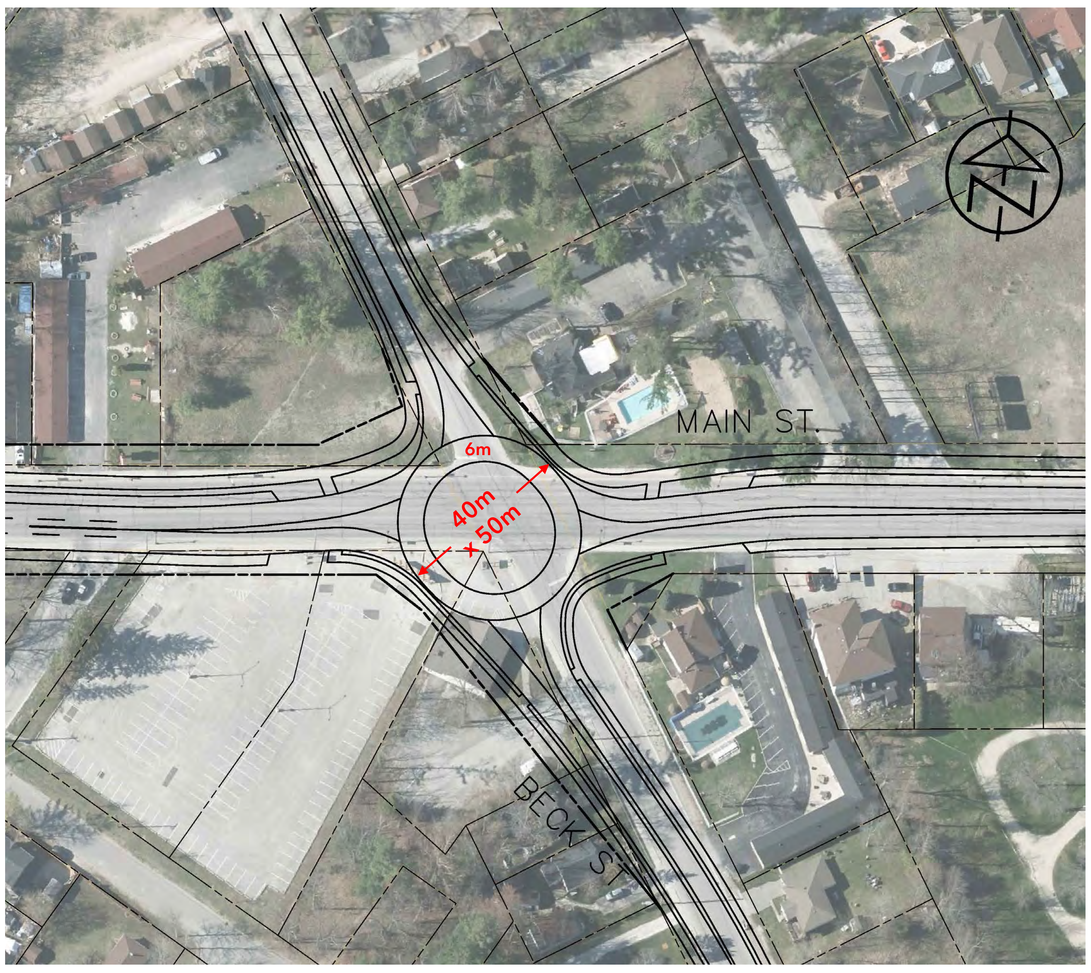
ROUNDABOUT OPERATIONS – 2041 PM Peak Hour

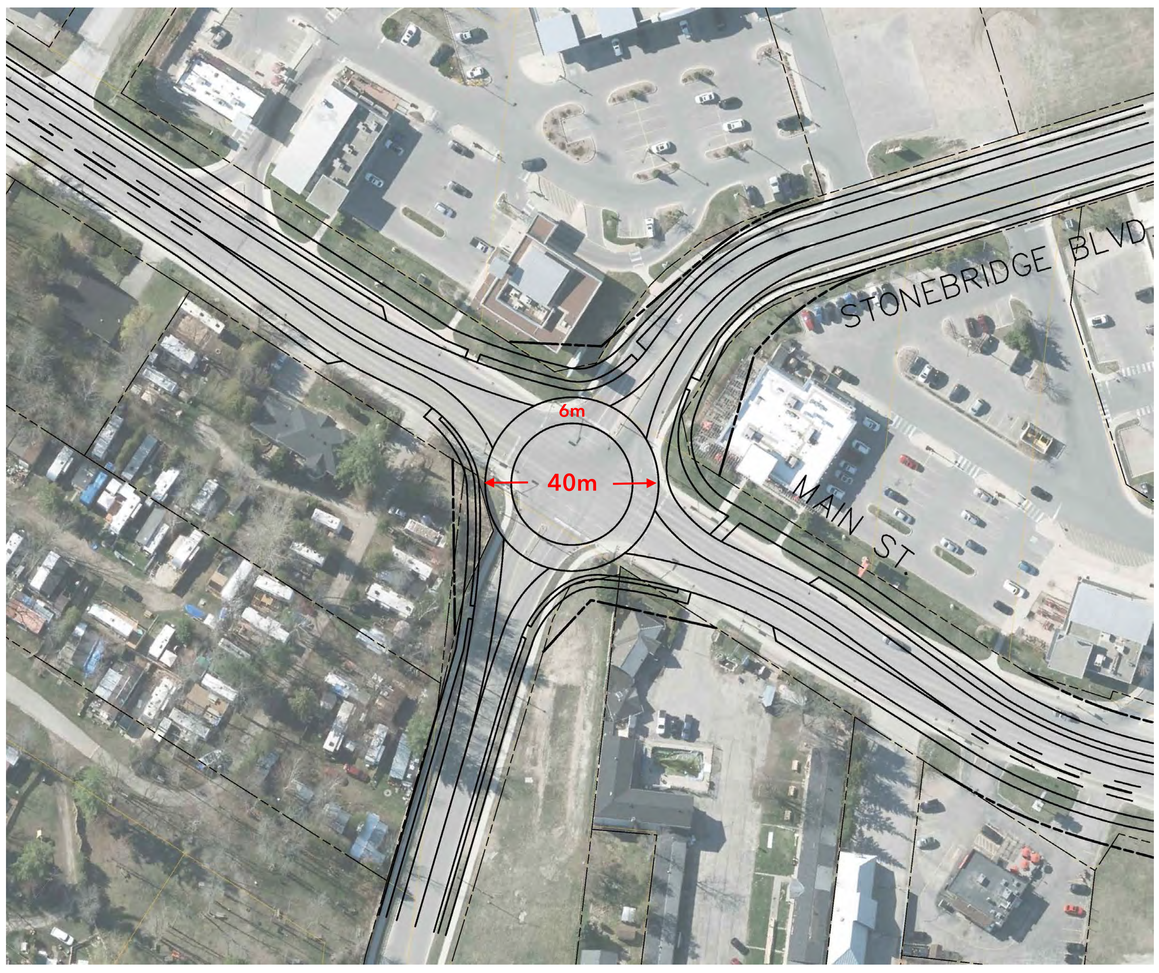


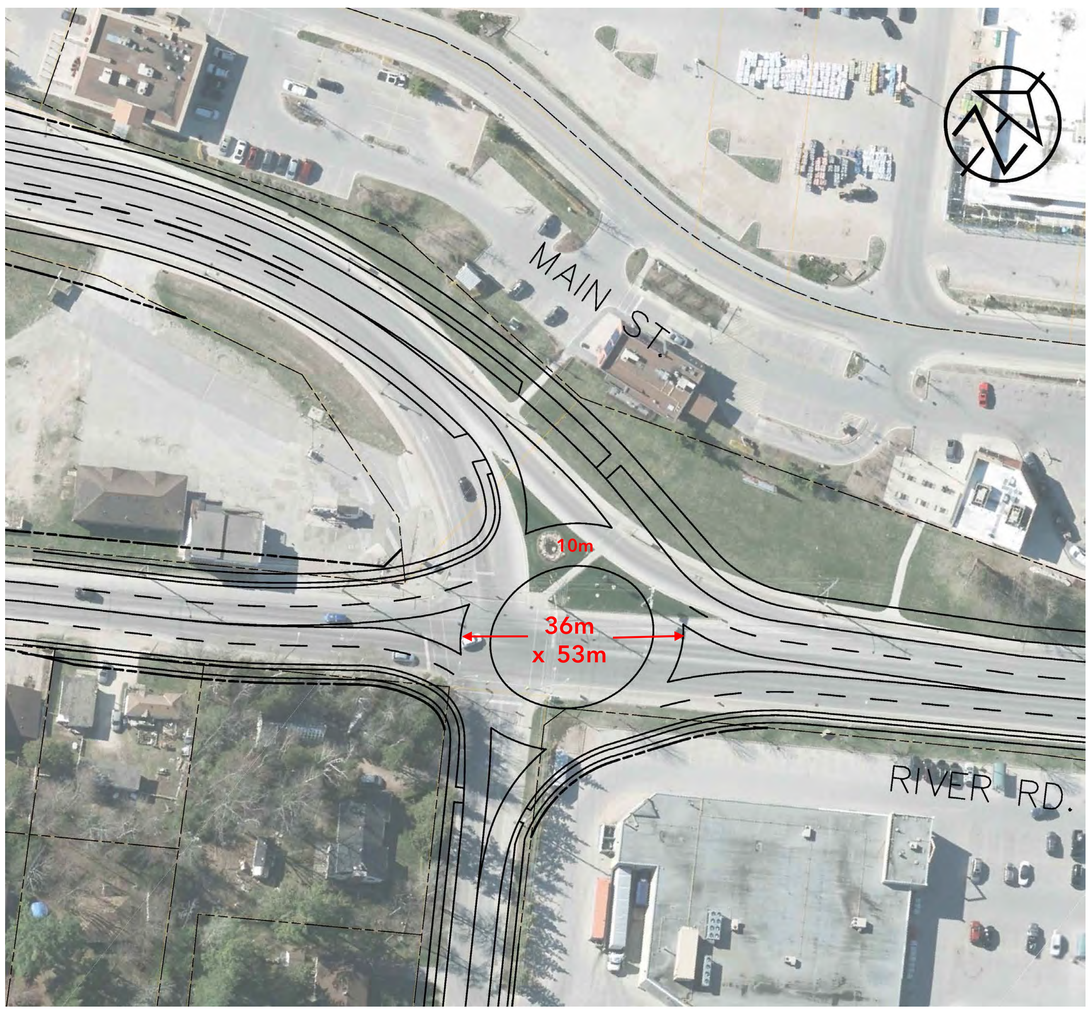
FUNCTIONAL DESIGNS



Roundabout configurations are PRELIMINARY in nature and are only intended to show the overall design approach, roundabout footprint and potential property impacts. Further detail design will be required.







EVALUATION OF ROUNDABOUTS

Roundabouts are recommended to be further considered at the noted intersections:

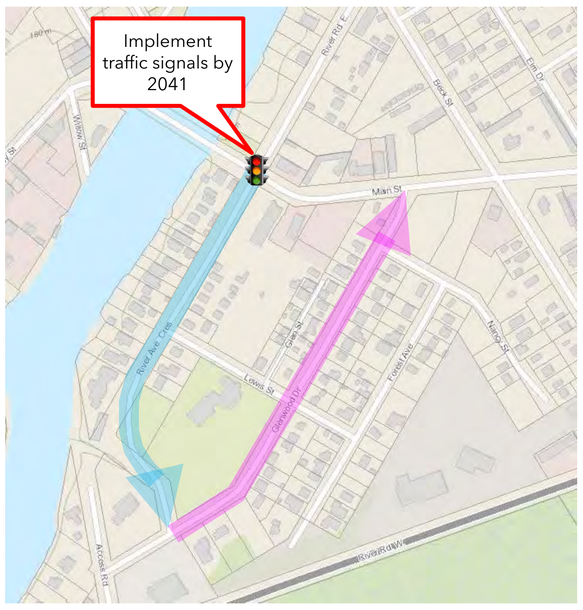
- Main Street & River Road West
- Main Street & Stonebridge Boulevard
- Main Street & Beck Street.

As area development occurs, the Town should take the necessary steps to protect for the potential for roundabouts in the near future.

Given the proposed closure of Beach Drive to automobile traffic, and in considering the redevelopment potential of the area and the associated changes to the road system expected (namely to the side streets), roundabouts along Mosley Street are not considered necessary.

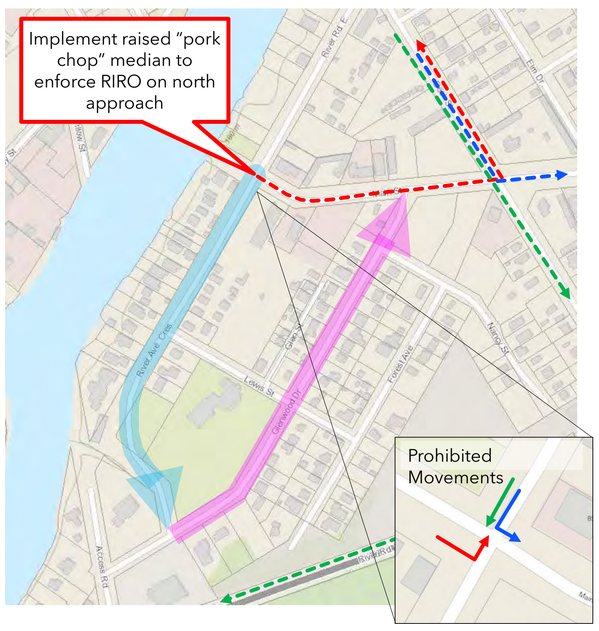
IMPROVEMENT OPTIONS

Option 1
Maintain Existing Configuration



- Currently, River Avenue Crescent is one-way southbound between Main Street and Glenwood Drive, whereas Glenwood Drive is one-way northbound between River Avenue Crescent and Main Street.
- Sight line concerns in both directions along Main Street at River Avenue Crescent/River Road East due to the bridge to the west and horizontal curve to the east
- Poor operations at intersection of Main Street with River Avenue Crescent/River Road East by 2041 under future total conditions (LOS F, v/c = 1.32, delay = 235 seconds).
- Proposed 3-lane cross-section on Main Street will provide exclusive left turn lanes but will not improve 2041 intersection conditions. If existing configuration is maintained, intersection improvements required by 2041 (traffic signals)
- While signal control addresses some of the sight line issues, left turns from Main Street to River Avenue Crescent and River Avenue East during green phase will still be completed with reduced sight lines for oncoming traffic

Option 2
RIRO on River Road East at Main Street



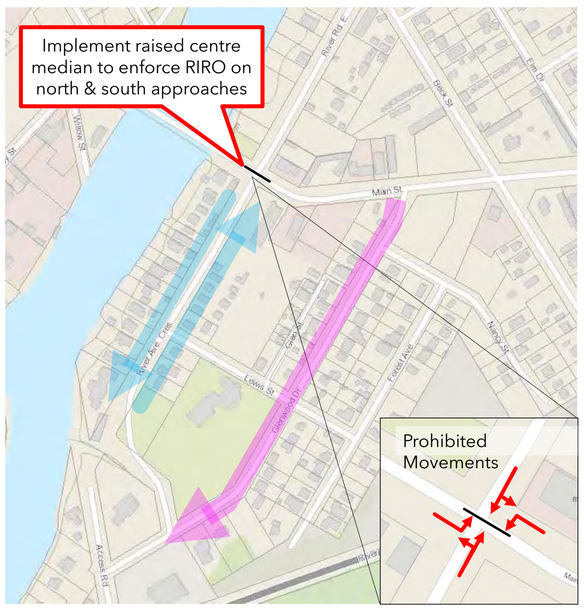
- Maintain River Avenue Crescent and Glenwood Drive as currently exist
- Implement raised "pork chop" island on River Avenue East at Main Street or centre median on Main Street to create a right-in/right-out (RIRO)
- RIRO eliminates left turns to/from River Avenue East at Main Street and southbound through from River Avenue East to River Avenue Crescent – thus addressing most of the critical safety concerns at the intersection (although WB left to River Avenue Crescent remains)
- RIRO addresses poor operating conditions through 2041
- Some redistribution of traffic (as illustrated in in-set) will occur with restricted left turn movements

Option 3
Convert River Avenue Crescent to two-way with traffic signals at Main Street

- Convert River Avenue Crescent to two-way operations through removal of existing bicycle lanes
- Signalize intersection of River Avenue Crescent/River Road East with Main Street by 2031
- Conversion will likely result in increased volumes on River Avenue Crescent as road becomes two-way connection between River Road West and Main Street
- Decrease in volumes on Glenwood Drive anticipated
- While signal control addresses some of the sight line issues, left turns from Main Street to River Avenue Crescent and River Avenue East during green phase will still be completed with reduced sight lines for oncoming traffic

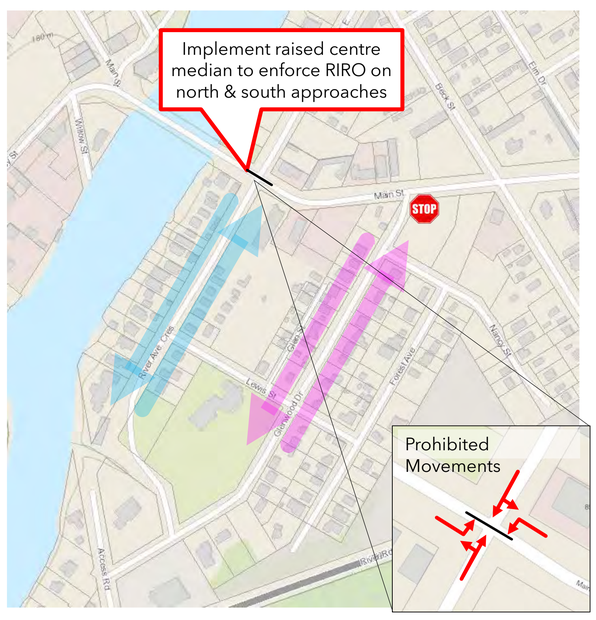
IMPROVEMENT OPTIONS

Option 4
Convert River Avenue Crescent to two-way operations with raised centre median on Main Street
Reverse Glenwood Drive to one-way operations in the southbound direction



- Convert River Avenue Crescent to two-way operations through removal of existing bicycle lanes
- Implement raised centre median on Main Street at River Avenue Crescent/River Road East to eliminate all left turn and crossing manoeuvres at the intersection
- Reversing operations on Glenwood Drive to one-way in the southbound direction allows for inbound left turns from Main Street, which are otherwise eliminated at River Crescent Avenue
- No construction required along Glenwood Drive (ie. road already accommodates one-way traffic)
- Future construction of roundabouts along Main Street at Beck Street and/or Stonebridge Boulevard would provide turnaround option for motorists in River Avenue Crescent/Glenwood Drive area that would like to head towards the beach but are unable to due to the raised median
- In absence of roundabouts on Main Street, motorists in the River Avenue Crescent/Glenwood Drive area wanting to access the Beach would be required to travel east on Main Street, north on Beck Street and south on River Avenue East – thus increasing traffic on the noted streets.

Option 5
Convert River Avenue Crescent to two-way operations with raised centre median on Main Street
Convert Glenwood Drive to two-way operations with full moves intersection on Main Street



PREFERRED

- Convert River Avenue Crescent to two-way operations through removal of existing bicycle lanes
- Implement raised centre median on Main Street at River Avenue Crescent/River Road East – thus enforcing right-in/right-out only
- Convert Glenwood Drive to two-way operations (requires widening of existing road platform to a minimum of 6.5m)
- Full moves intersection at Glenwood Drive with Main Street (stop control on Glenwood Drive will operate acceptably through 2041)
- Eliminates all left turn and crossing manoeuvres at River Avenue Crescent/River Road East intersection
- Full movements at Glenwood Drive provides alternate location for inbound left turns from Main Street (ie. those displaced from River Avenue Crescent)

EVALUATION OF OPTIONS

The preferred option to address River Avenue Crescent and Glenwood Drive is Option 5

- Eliminates safety concerns at Main Street and River Avenue Crescent/River Road East intersection with respect to sight lines and crossing manouevres
- Improves traffic flow in and out of River Avenue Crescent/Glenwood Drive neighbourhood
- Full movement intersection at Glenwood Drive and Main Street will accommodate inbound left turns from Main Street that will otherwise be prohibited at River Avenue Crescent
- Simplifies road network for motorists - does not require overly complicated alternative routes that are otherwise induced by the combination of one-way operations and restricted turning movements.

ROAD ALIGNMENTS & WIDENING

Main Street

- Maintain existing 30m ROW section (River Road West to Beck Street)
- Increase 20m ROW section (Beck Street to River) to 30m by widening 5m equally on both side

Mosley Street

- Introduce a 23m ROW
- Widen road on the both sides from Spruce Street to 2nd Street
- Widen & straighten ROW from 2nd Street to 6th Street

Beach Drive

- Introduce a 20m ROW
- Shift road alignment south by 7.5m to increase beach area under high water conditions (Option 2)
- No impact to Ontario Parks lands

ROAD CROSS-SECTIONS

Main Street

- Option 3

Mosley Street

- Option 2

Beach Drive

- Option 2

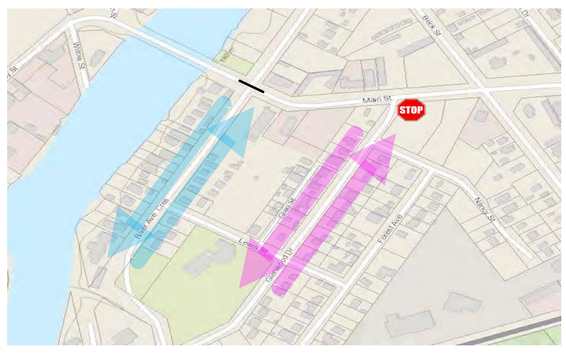
ROUNDABOUTS

Main Street & Beck Street

Main Street & Stonebridge Blvd

Main Street & River Road West

RIVER AVENUE CRESCENT & GLENWOOD DRIVE



Option 5

- Convert River Avenue Crescent to two-way operations with raised centre median on Main Street
- Convert Glenwood Drive to two-way operations with full moves intersection on Main Street

NEXT STEPS

- All public comments will be reviewed and summarized.
- The development of the Alternative Design Concepts will be revisited and additional options and/or modifications to existing options will be considered, as necessary.
- The assessment of the Alternative Design Concepts will be revisited in context of the public comments and updated, as necessary.
- The Preferred Design Concepts will be identified.
- An Environmental Study Report will be prepared to document the Class EA process and the development and assessment of the Alternative Solutions and Alternative Design Concepts.
- A Notice of Study Completion will be circulated to inform the Public of the completion of the report and provide further opportunity for comment and review

Main Street and Beach Areas 1 & 2 Improvements

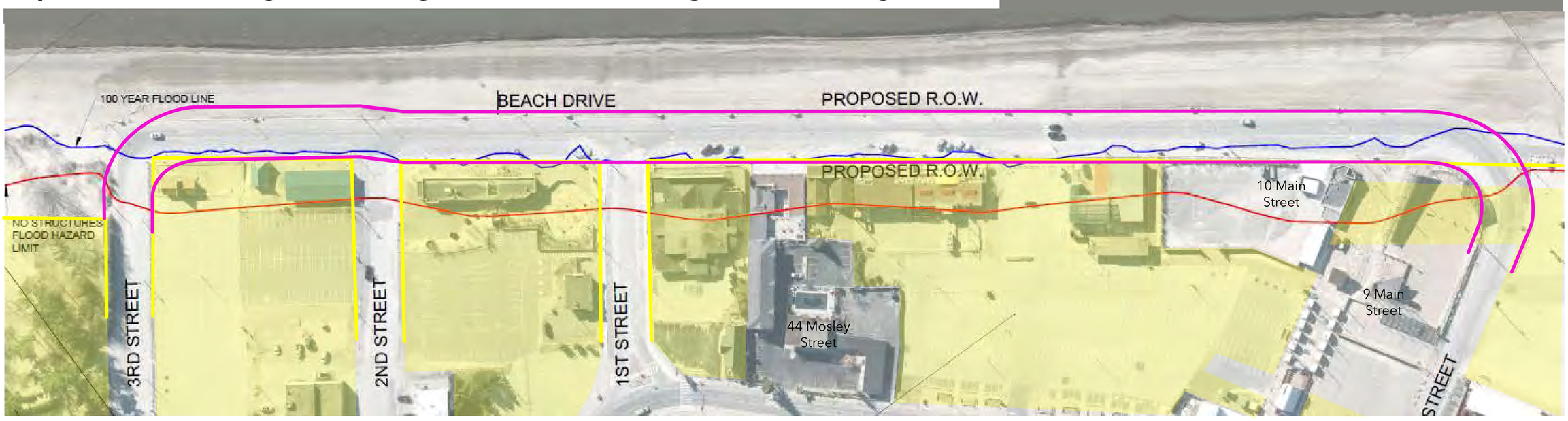
BEACH DRIVE

Main Street and Beach Areas 1 & 2 Improvements

ROAD ALIGNMENT & WIDENING

BEACH DRIVE

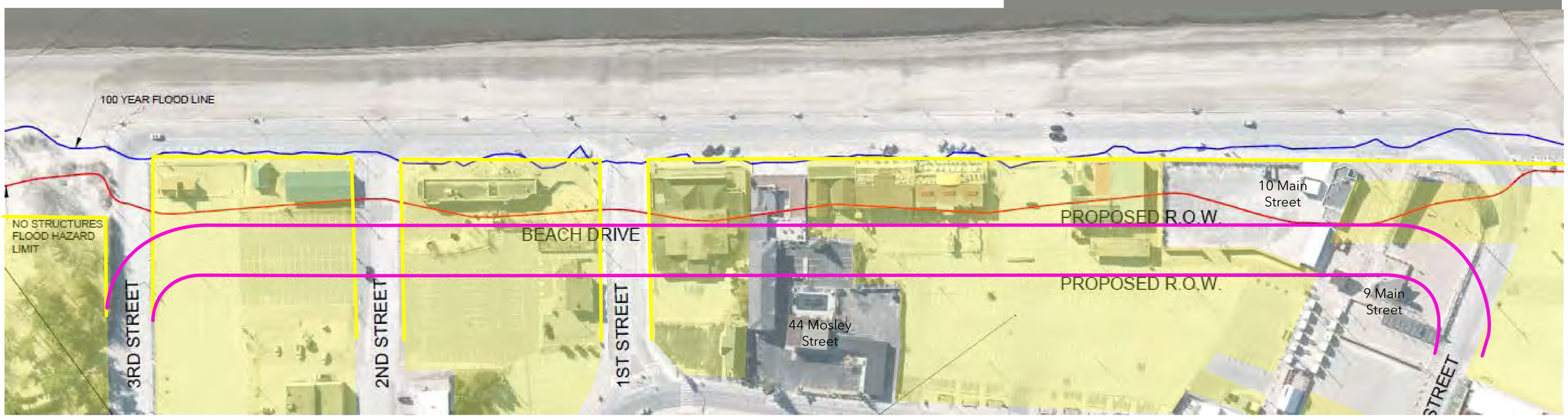
Option 1: Existing Road Alignment (south edge at buildings)



Option 2: 100 Year Flood Line (shift of 24 metres south)

PREFERRED

Option 3: No Structure Flood Hazard Limit (shift 46 metres south)



existing right-of-way Town property proposed 20m right-of-way

EVALUATION OF OPTIONS

INTERSECTION OPERATIONS

To identify intersection improvements required to accommodate planned growth, operations at the study area intersections were reviewed based on the following:

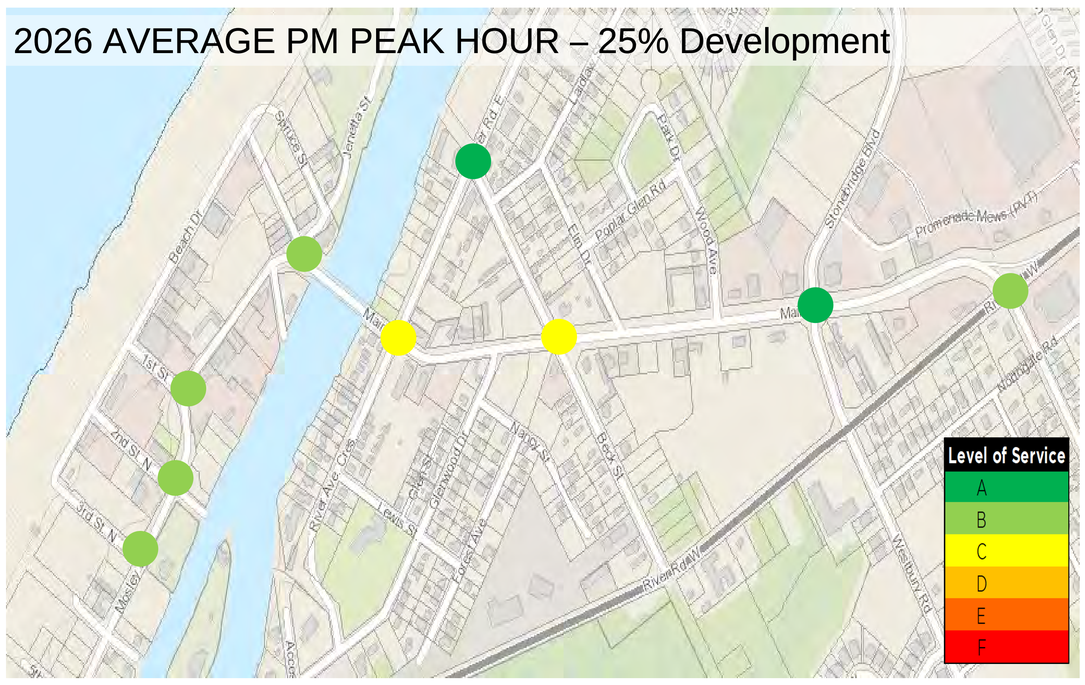
- Projected traffic volumes for 2026, 2031 & 2041
- Proposed 3-lane cross-sections on Main Street and Mosley Street
- Closure of Beach Drive

Closure of Beach Drive

- Volumes on 1st, 2nd, 3rd and Spruce Street have been adjusted to reflect the closure of Beach Drive, as each will predominantly serve as access roads to future development
- 1st Street and Spruce Street have been reconfigured to serve two-way traffic (inbound and outbound)

2026 Average PM Peak Hour

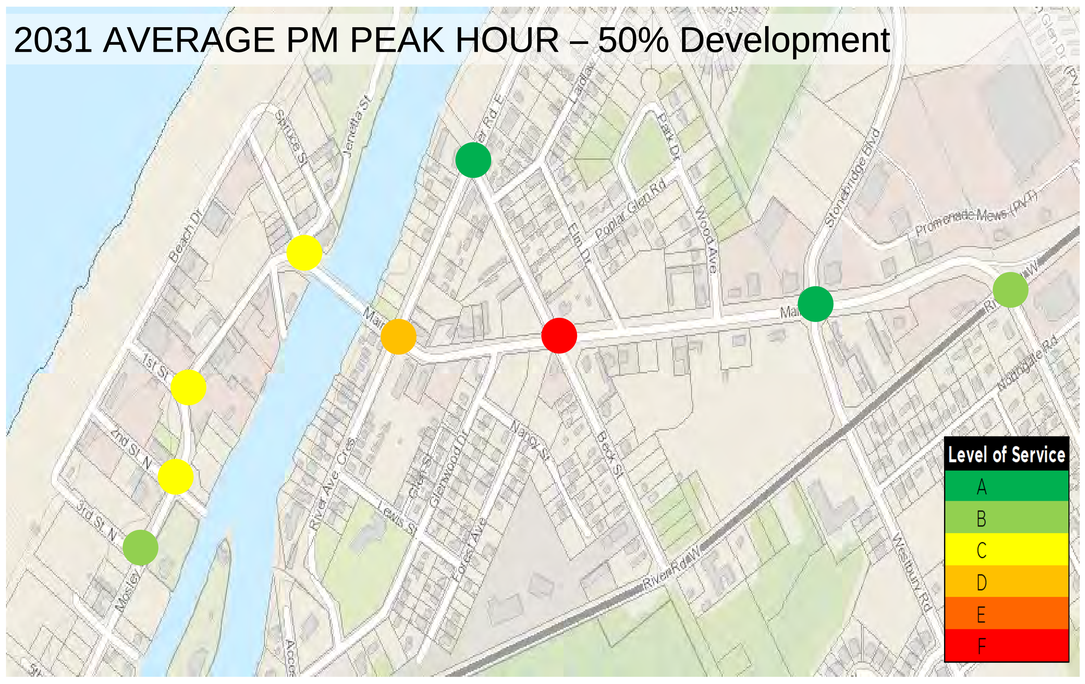
- All intersections provide acceptable operations (Level of Service C or better)
- No intersection improvements are necessary to support 2026 conditions



2031 Average PM Peak Hour

Improvements required to address poor intersection operations at the following intersections

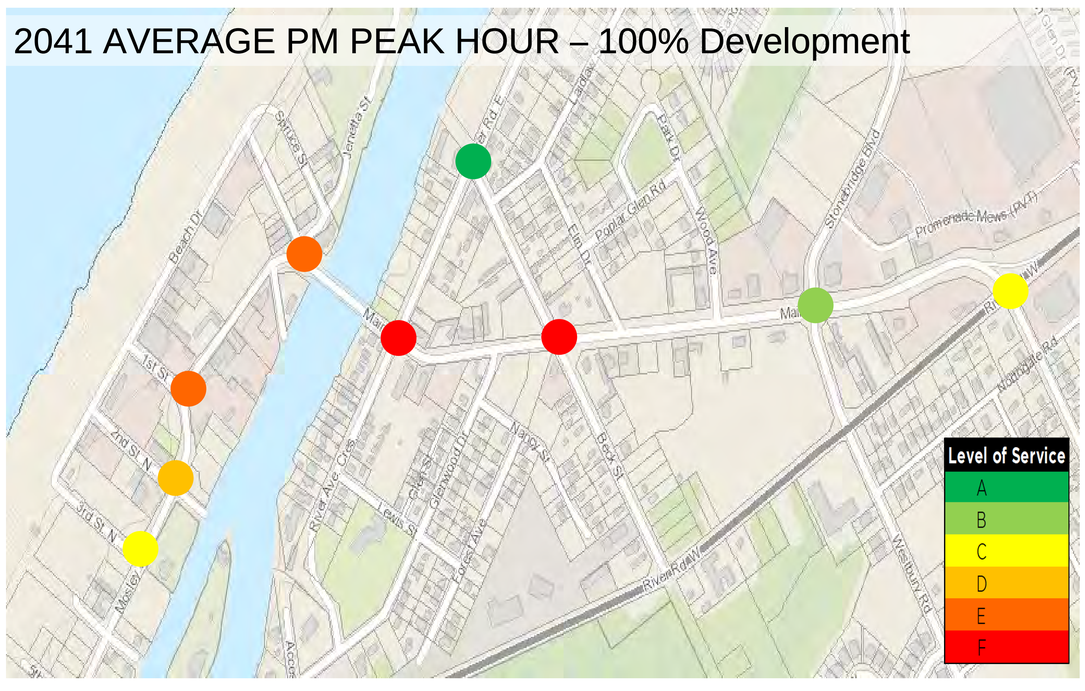
- Beck Street & Main Street
  - Potential improvements:
    - traffic signals
    - roundabout



2041 Average PM Peak Hour

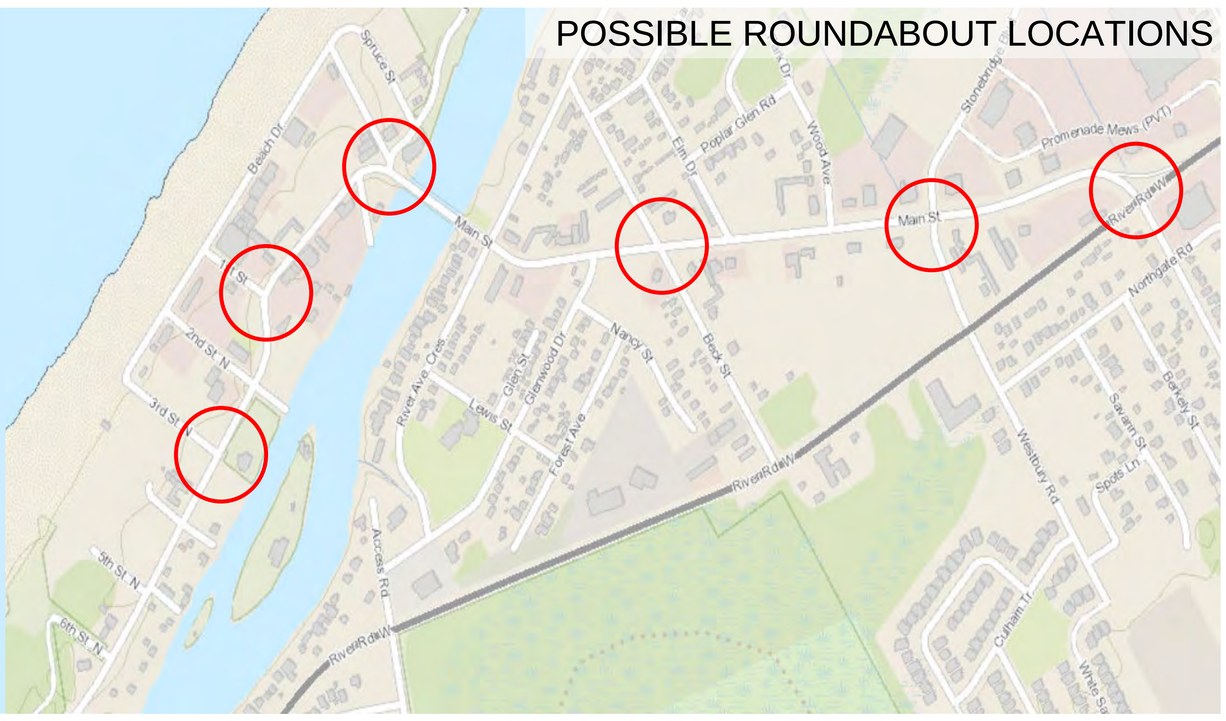
Improvements required to address poor intersection operations at the following intersections

- River Road East/River Crescent Avenue & Main Street
  - Potential improvements
    - traffic signals
    - turn restrictions and/or other improvements
- While still acceptable, operations at the following intersections are approaching poor (LOS E) and may warrant improvements:
  - 1st Street & Mosley Street (traffic signals or roundabout)
  - Spruce Street & Main Street (traffic signals or roundabout)



CONSIDERATION FOR ROUNDABOUT CONTROL

- The feasibility of implementing roundabouts has been reviewed for the following intersections:
  - River Road West & Main Street/Ansley Road
  - Stoneridge Boulevard & Main Street
  - Beck Street & Main Street
  - Spruce Street & Main Street & Mosley Street
  - 1st Street & Mosley Street
  - 3rd Street & Mosley Street
- Assessment has considered single lane roundabouts, with the exception of the River Road West approaches at Main Street

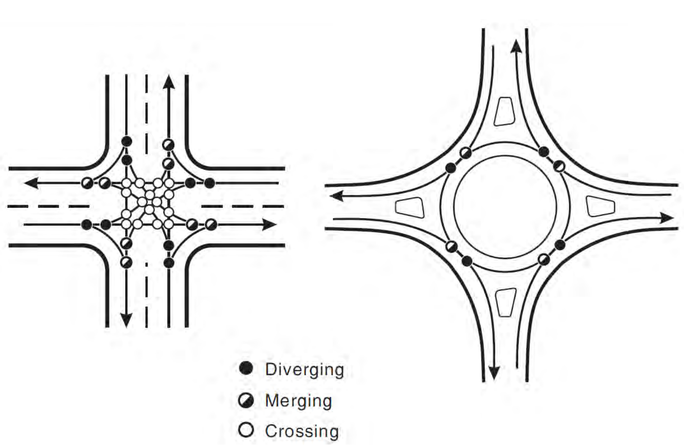


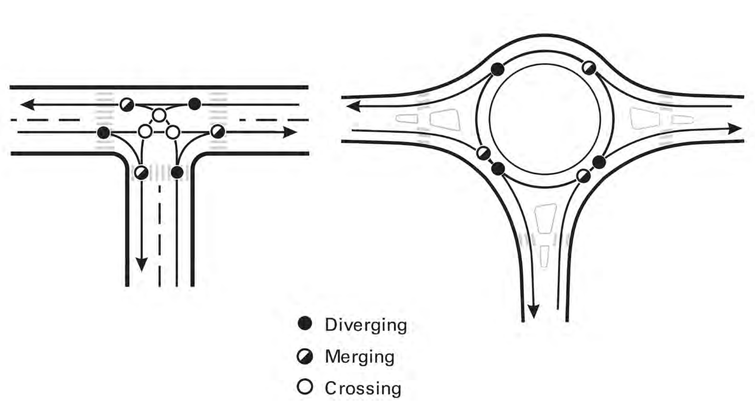
Advantages

- Increased safety
  - significant decrease in severe accidents
  - less conflict points than standard intersection
  - lower speeds (reduces severity of accidents)
- Greater capacity than a signal or all-way stop control intersection operating at the same Level of Service
- Traffic calming effect
- Environmental benefits – reduces stop and go traffic which reduces emissions, fuel consumption and noise
- Aesthetically pleasing (landscaped islands)
- Unaffected by power outages

Disadvantages

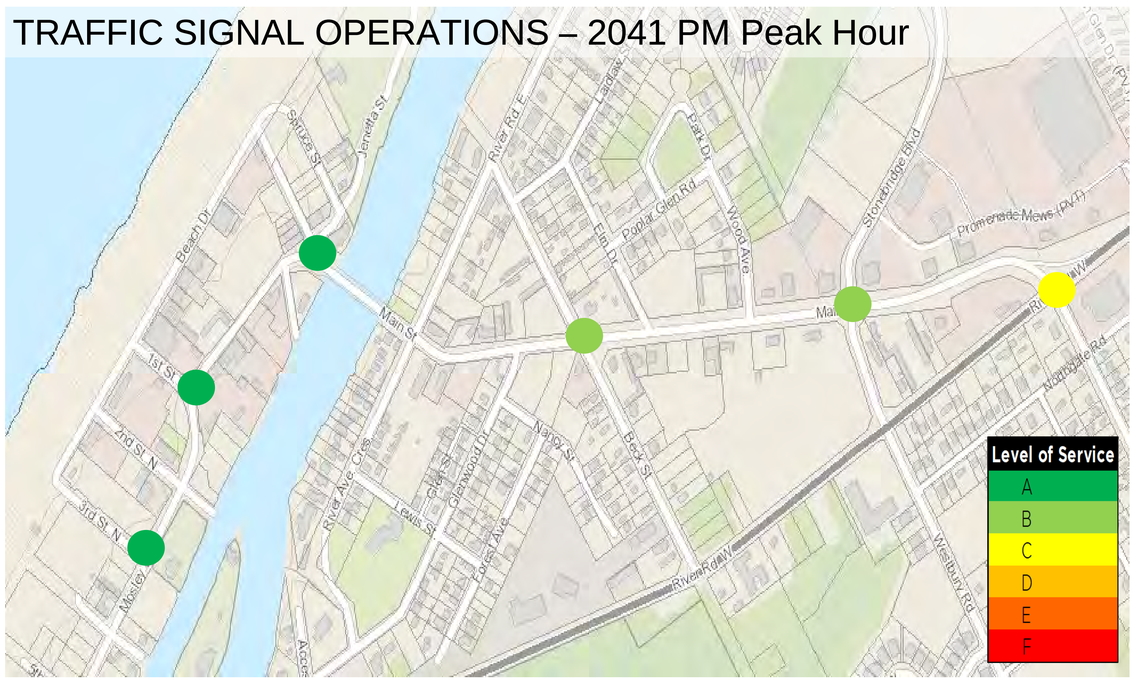
- Land requirements are typically greater than standard intersection
- Difficult for pedestrians to cross – particularly for those with vision impairment
- Can be intimidating for cyclists to navigate
- Dual or multi-lane roundabouts result in increased accidents (albeit non-injury crashes)
- No provision for emergency vehicle priority
- Can disrupt vehicle platoons if placed along a signal coordinated corridor



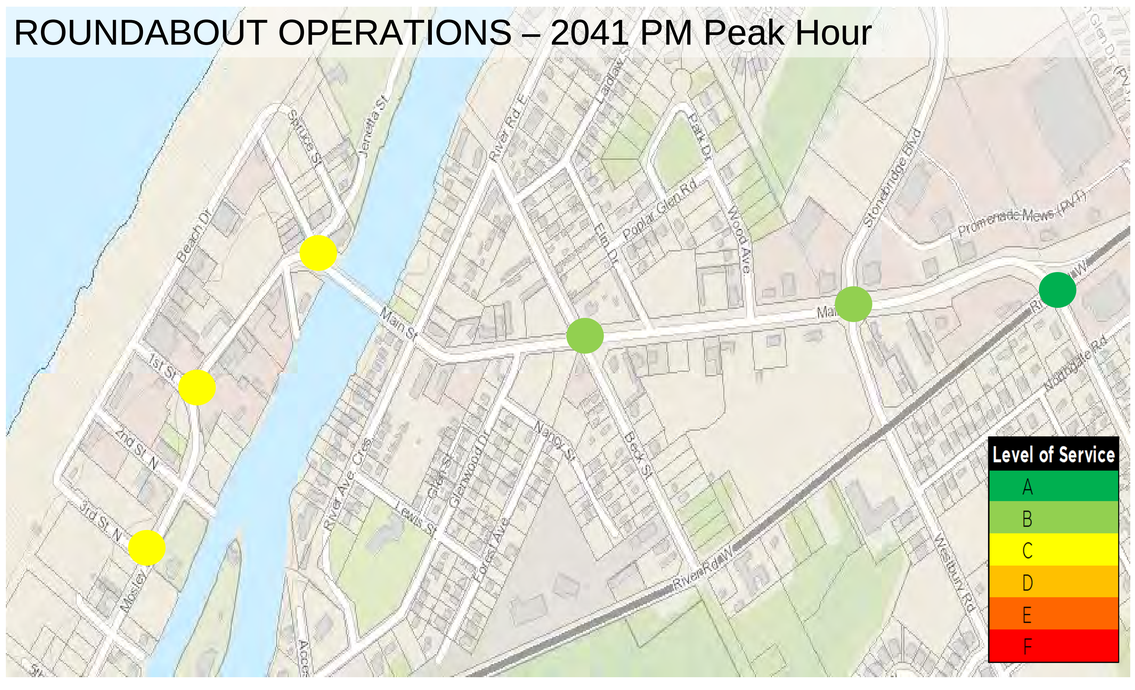


TRAFFIC SIGNAL CONTROL VS ROUNDBOUT CONTROL

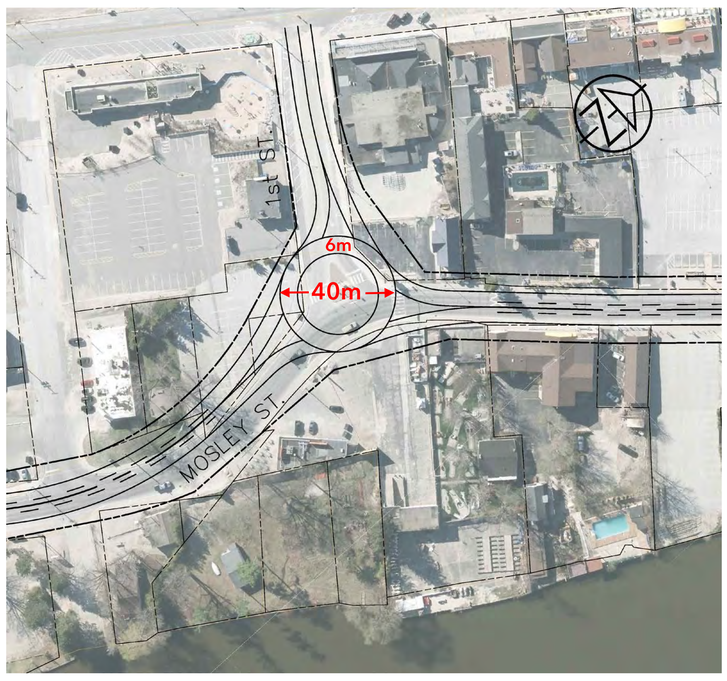
TRAFFIC SIGNAL OPERATIONS – 2041 PM Peak Hour



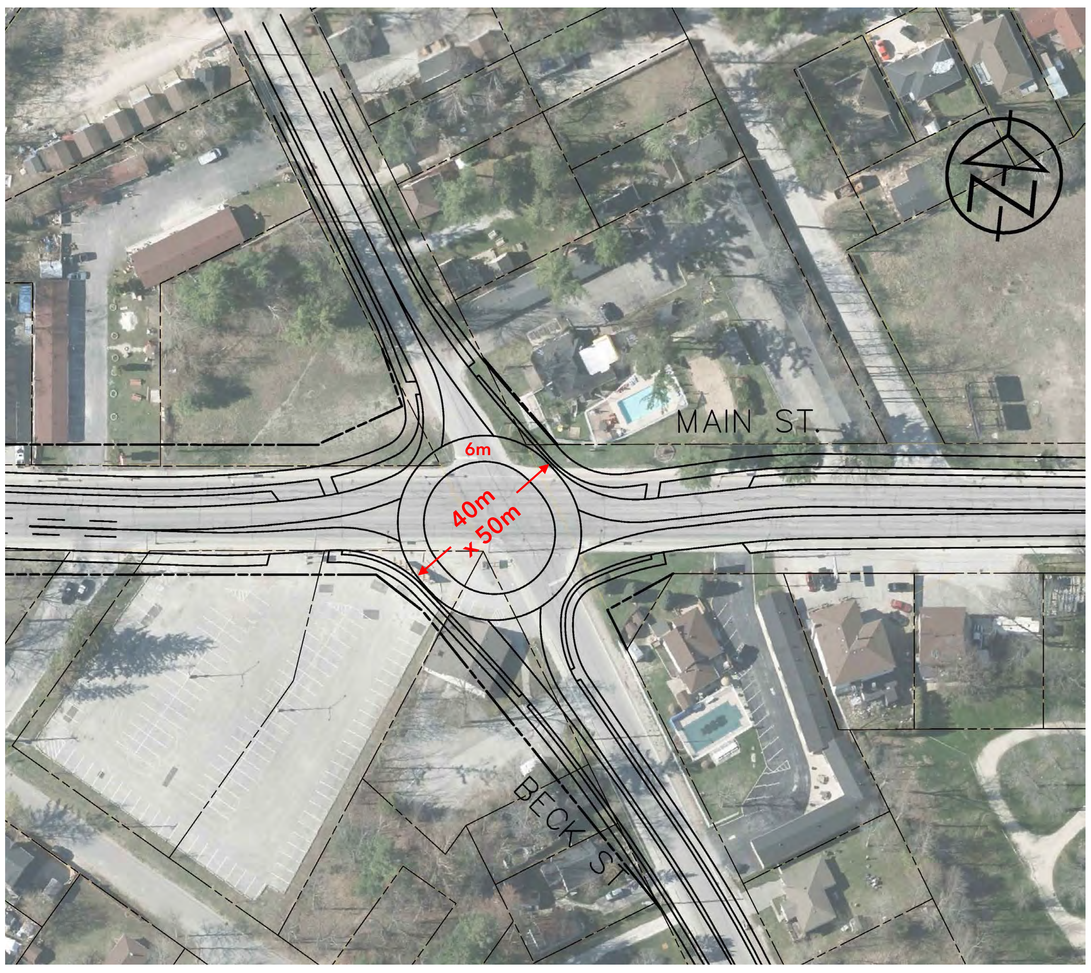
ROUNDABOUT OPERATIONS – 2041 PM Peak Hour

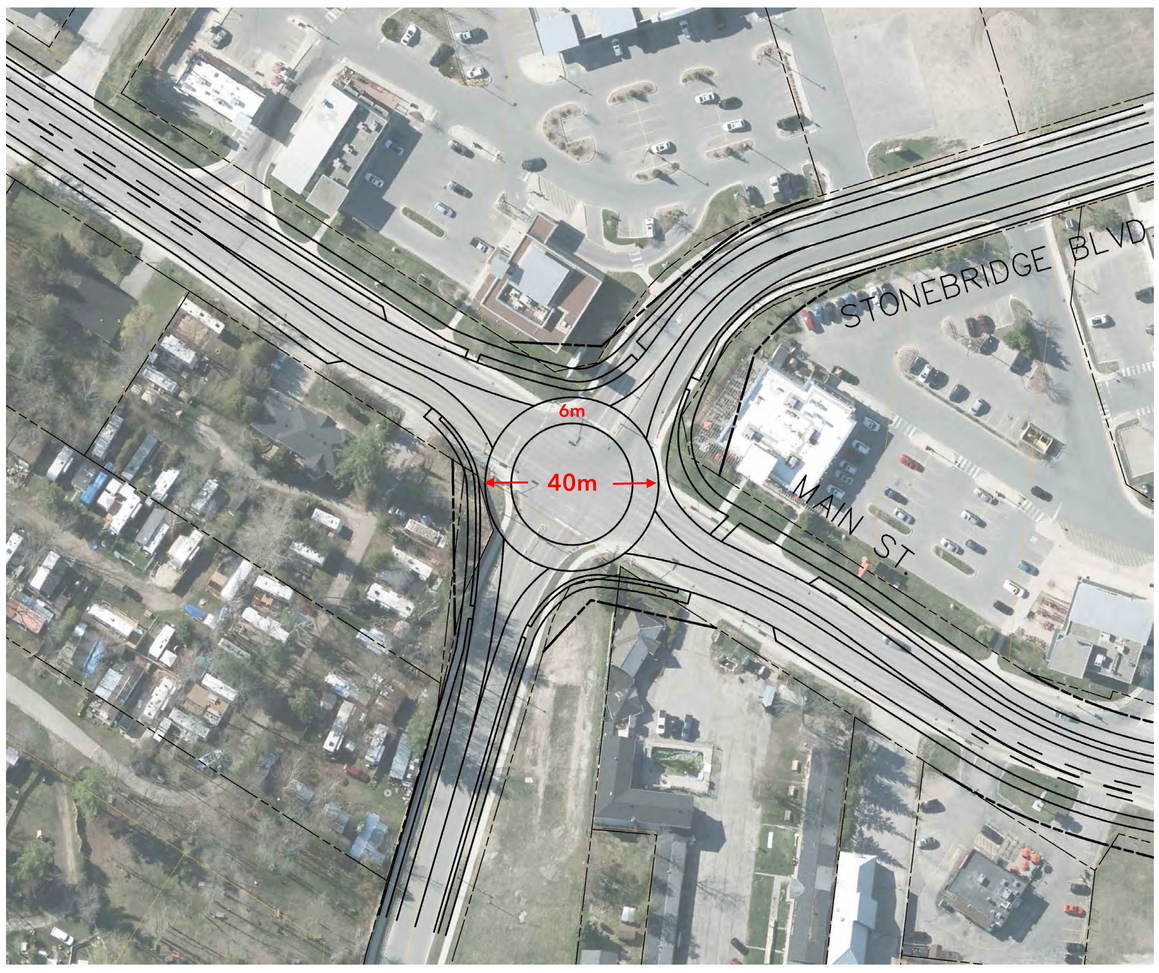


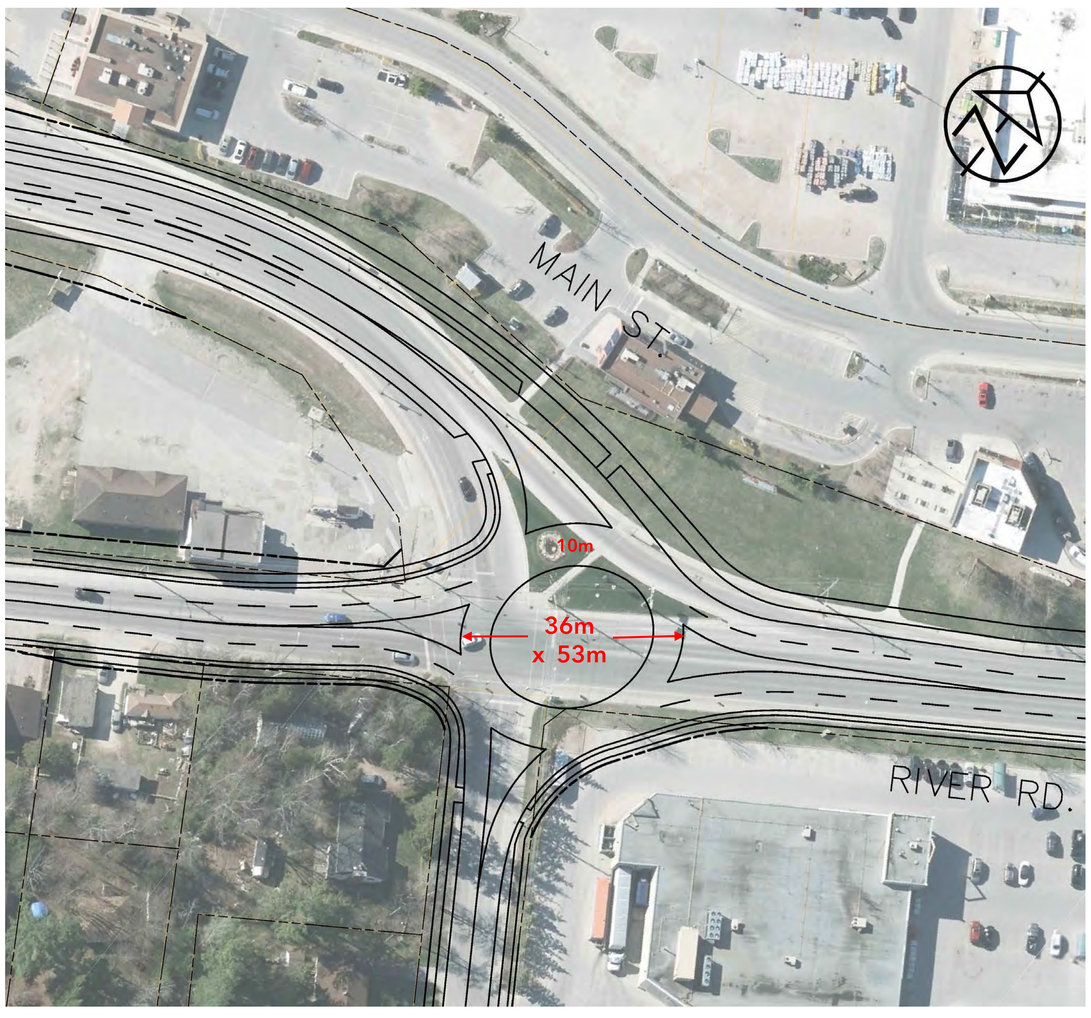
FUNCTIONAL DESIGNS



Roundabout configurations are PRELIMINARY in nature and are only intended to show the overall design approach, roundabout footprint and potential property impacts. Further detail design will be required.







EVALUATION OF ROUNDABOUTS

Roundabouts are recommended to be further considered at the noted intersections:

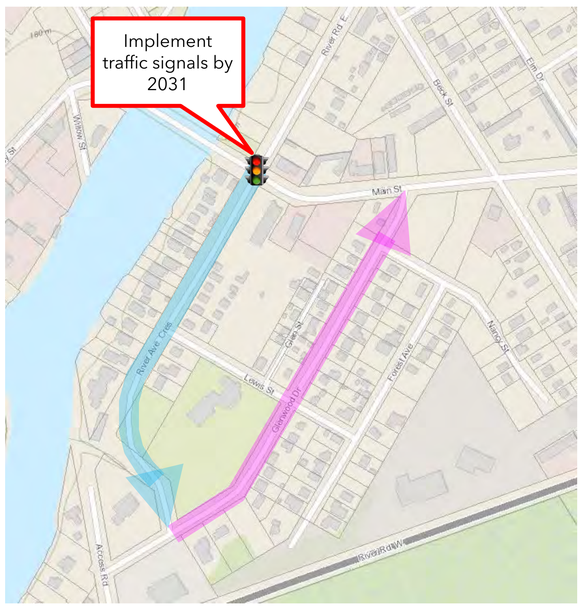
- Main Street & River Road West
- Main Street & Stonebridge Boulevard
- Main Street & Beck Street.

As area development occurs, the Town should take the necessary steps to protect for the potential for roundabouts in the near future.

Given the proposed closure of Beach Drive to automobile traffic, and in considering the redevelopment potential of the area and the associated changes to the road system expected (namely to the side streets), roundabouts along Mosley Street are not considered necessary.

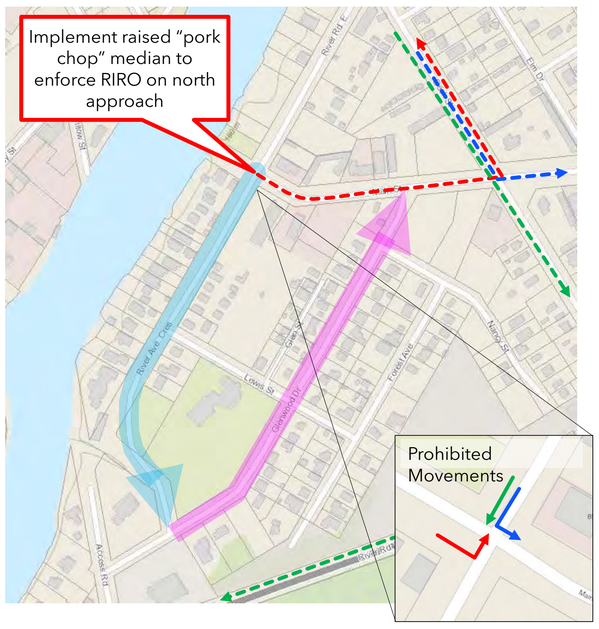
IMPROVEMENT OPTIONS

Option 1
Maintain Existing Configuration



- Currently, River Avenue Crescent is one-way southbound between Main Street and Glenwood Drive, whereas Glenwood Drive is one-way northbound between River Avenue Crescent and Main Street.
- Sight line concerns in both directions along Main Street at River Avenue Crescent/River Road East due to bridge to the west and horizontal curve to the east
- Poor operations at intersection of Main Street with River Avenue Crescent/River Road East by 2041 under future total conditions (LOS F, v/c = 1.32, delay = 235 seconds).
- Proposed 3-lane cross-section on Main Street will provide exclusive left turn lanes, but will not improve 2041 conditions
- If existing configuration is maintained, intersection improvements required by 2041 (traffic signals)

Option 2
RIRO on River Road East at Main Street



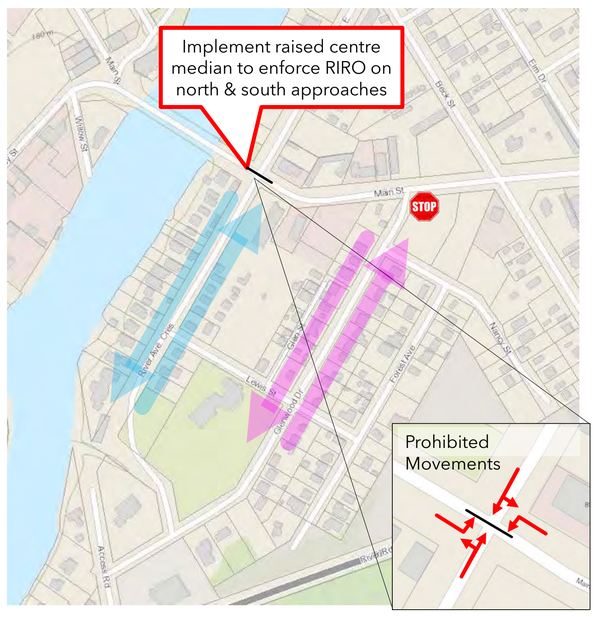
- Maintain River Avenue Crescent and Glenwood Drive as currently exist
- Implement raised "pork chop" island on River Avenue East at Main Street or centre median on Main Street to create a right-in/right-out (RIRO)
- RIRO eliminates left turns to/from River Avenue East at Main Street and southbound through from River Avenue East to River Avenue Crescent – thus addressing most of the critical safety concerns at the intersection (although WB left to River Avenue Crescent remains)
- RIRO addresses poor operating conditions through 2041
- Some redistribution of traffic (as illustrated in in-set) will occur with restricted left turn movements

Option 3
Convert River Avenue Crescent to two-way with traffic signals at Main Street

- Convert River Avenue Crescent to two-way operations through removal of existing bicycle lanes
- Signalize intersection of River Avenue Crescent/River Road East with Main Street by 2031
- Conversion will likely result in increased volumes on River Avenue Crescent as road becomes connection two-way connection between River Road West and Main Street
- Decrease in volumes on Glenwood Drive anticipated
- While signal control addresses some of the sight line issues, left turns from Main Street to River Avenue Crescent and River Avenue East during green phase will still be completed with reduced sight lines for oncoming traffic

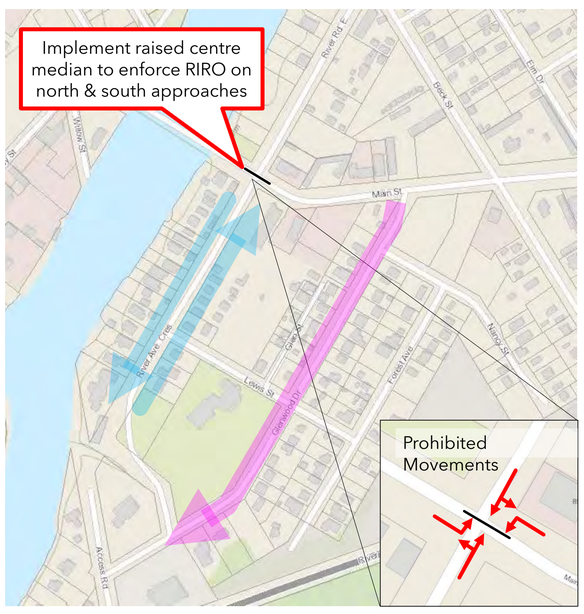
IMPROVEMENT OPTIONS

Option 4
Convert River Avenue Crescent to two-way operations with raised centre median on Main Street
Convert Glenwood Drive to two-way operations with full moves intersection on Main Street



- Convert River Avenue Crescent to two-way operations through removal of existing bicycle lanes
- Implement raised centre median on Main Street at River Avenue Crescent/River Road East –thus enforcing right-in/right-out only
- Convert Glenwood Drive to two-way operations (requires widening of existing road platform)
- Full moves intersection at Glenwood Drive with Main Street (stop control on Glenwood Drive will operate acceptably through 2041)
- Eliminates all left turn and crossing manoeuvres at River Avenue Crescent/River Road East intersection
- Full movements at Glenwood Drive provides alternate location for inbound left turns from Main Street (ie. those displaced from River Avenue Crescent)

Option 5
Convert River Avenue Crescent to two-way operations with raised centre median on Main Street
Reverse Glenwood Drive to one-way operations in the southbound direction



PREFERRED

- Convert River Avenue Crescent to two-way operations through removal of existing bicycle lanes
- Implement raised centre median on Main Street at River Avenue Crescent/River Road East –thus enforcing right-in/right-out only (eliminates all left turn and crossing manouevres
- Eliminates all left turn and crossing manoeuvres at River Avenue Crescent/River Road East intersection
- Reversing operations on Glenwood Drive to one-way in the southbound direction allows for inbound left turns from Main Street, which are otherwise eliminated at River Crescent Avenue.
- No construction required along Glenwood Drive (ie. road already accommodates one-way traffic)
- Future construction of roundabouts along Main Street at Beck Street and/or Stoneridge Boulevard would provide turnaround option for motorists in River Avenue Crescent/Glenwood Drive area that would like to head towards the beach but are unable to due to the raised median

EVALUATION OF OPTIONS

The preferred option to address River Avenue Crescent and Glenwood Drive is Option 5

ROAD ALIGNMENTS & WIDENING

Main Street

- Maintain existing 30m ROW section (River Road West to Beck Street)
- Increase 20m ROW section (Beck Street to River) to 30m by widening 5m equally on both side

Mosley Street

- Introduce a 23m ROW
- Widen road on the north side from Spruce Street to 2nd Street
- Widen & straighten ROW from 2nd Street to 6th Street

Beach Drive

- Introduce a 20m ROW
- Shift road alignment south, outside of the 100-year flood limit

ROAD CROSS-SECTIONS

Main Street

- Option 3

Mosley Street

- Option 2

Beach Drive

- Option 2

ROUNDABOUTS

Main Street & Beck Street

Main Street & Stonebridge Blvd

Main Street & River Road West

RIVER AVENUE CRES & GLENWOOD DRIVE

Option 5

- Convert River Avenue Crescent to two-way operations with raised centre median on Main Street
- Reverse Glenwood Drive to one-way operations in the southbound direction

NEXT STEPS

- All public comments will be reviewed and summarized.
- The development of the Alternative Design Concepts will be revisited and additional options and/or modifications to existing options will be considered, as necessary.
- The assessment of the Alternative Design Concepts will be revisited in context of the public comments and updated, as necessary.
- The Preferred Solutions will be identified.
- An Environmental Study Report will be prepared to document the Class EA process and the development and assessment of the Alternative Solutions and Alternative Design Concepts.
- A Notice of Study Completion will be circulated to inform the Public of the completion of the report and provide further opportunity for comment and review

PIC 2 Summary of Public Comments

Respondent	REPRESENTATION					MAIN STREET						
	Question 1: Stakeholder category					Q2: Agree with widening		Q3: Preferred cross-section				
	resident	business owner	agency	other	Comment	yes	no	Option 1	Option 2	Option 3	Other	Comment
1	x					x			x			
2	x					x			x			
3				x	property owner					x		
4	x					x		x				Really depends on what development takes place on Main Street since some plans have
5	x					x				x		
6	x					x				x		
7	x					x				x		
8	x					x				x		Clear criteria/regulations would be required to request patio space over parking on the south side
9	x					x	x				x	Amenity/patio area should be adjacent to the commercial properties not separated by a
10	x					x				x		
11	x					x				x		
12	x					x				x		
13	x					x				x		I would prefer cycle lane on each side of the street instead of a cycle path on just the north side of Main
Total	12	0	0	1		12	1	1	2	9	1	
Percent	**92%**	0%	0%	8%		**92%**	8%	**8%**	15%	69%	8%	
Responses	13					13		13				

PIC 2

Respondent	MOSLEY STREET											
	Q4: Widen from River to 2nd					**Q5: Widen 2nd to 6th**		**Q6: Preferred cross-section**				
	Option 1	Option 2	Option 3	Other	Comment	yes	no	Option 1	Option 2	Option 3	Other	Comment
1			x		bike laneway should still be included	x				x		bike laneway should still be included
2			x			x			x			
3			x			x			x			
4	x				Again, what development will happen here to improve tourism and a desire for residents to visit.							
5			x			x			x			
6			x			x		x				
7			x			x			x			
8			x			x			x			
9				x	The options do not include cost comparisons. This is an important aspect of the decision. ie. Option 3	x	x				x	Get rid of centre turn lane, expand outdoor retail by 1.25m on each side. Where a turn lane is needed
10			x			x			x			
11			x			x				x		
12			x			x			x			
13	x					x			x			
Total	2	0	10	1		12	1	1	8	2	1	
Percent	**15%**	0%	77%	8%		**92%**	8%	8%	**67%**	17%	8%	
Responses	13					13		12				

PIC 2

Respondent	BEACH DRIVE										
	Q7: Widen/realign						Q8: Preferred cross-section				
	Option 1	Option 2	Option 3	Option 4	Other	Comment	Option 1	Option 2	Option 3	Other	Comment
1				x				x			
2			x						x		
3		x							x		
4			x			Better to prevent flooding issues that ruin business and tourism			x		Better use for pedestrian traffic and events as long as d
5		x						x			
6			x					x			
7		x						x			
8		x						x			
9					x	Survey should be reissued with estimated costs (including required property buyouts).				x	Get rid of the cycle track. Don't need it here. Cycle on Main and Mosley, cycles here create collision
10			x					x			
11			x				x				
12		x						x			
13			x						x		
Total	0	5	6	1	1		1	7	4	1	
Percent	0%	38%	**46%**	8%	8%		8%	**54%**	31%	8%	
Responses	13						13				

PIC 2

Respondent	ROUNDABOUTS						RIVER AVENUE CRESCENT & GLENWOOD DRIVE						
	Q9: Support roundabout at						Q10: Preferred configuration						
	Main/RRW	Main/SB	Main/Beck	Mosley/Spruce	Mosley/1st	Mosley/3rd	Option 1	Option 2	Option 3	Option 4	Option 5	Other	Comment
1	y	y	n	n	y	y					x		
2	y	n	n	n	y	y				x			
3	y	y	y	y	y	y					x		
4	y	y	n	n	y	n					x		Much better traffic flow if one-ways are eliminated
5	n	n	n	n	n	n	x						
6	y	n	y	y	y	y					x		
7	y	y	y	n	n	n			x				add sidewalks and bike lanes to Glenwood Dr
8	y	y	y								x		
9	n	n	y		n	y					x		
10	y	y	y	y	y	y					x		
11	n	n	n	n	n	n					x		
12	y	y	y	y	y	y					x		
13	y	n	y	y	y	n						x	Maintain existing + traffic lights at Main/River Ave Cr + two-way cycle lanes on Glenwood Drive
Total	**yes = 10**	**yes = 7**	**yes = 8**	**yes = 5**	**yes = 8**	**yes = 7**	1	0	1	1	9	1	
Percent	no = 3	no = 6	no = 5	**no = 6**	no = 4	no = 5	8%	0%	8%	8%	69%	8%	
Responses							13						

PIC 2

Respondent	OTHER COMMENT Q11: Other Comment
1	More crosswalks, medians and speed bumps on Mosley Street should be implemented in all options to help reduce speed, street racing and for residents and tourists.
2	Hope to see this improvement started as soon as possible.
3	We support the smart redevelopment of the area focussed on local economic development, tourism and active living for residents and tourists alike. The options presented in the EA study support this vision.
4	Much depends on what actually gets developed since the DDMP has been severely diluted by current Council. What will attract peopled to this area is there is no features like a civic square/community hub?
5	
6	Great work, let's get thus project going sooner than later.
7	See comment sheet for additional commentary re: Glenwood Drive
8	
9	See comment sheet for comments re: access to provincial park and backup of traffic to Main Street. Needs to be another river crossing to reduce traffic load on Mosley and Main Street bridge.
10	Consider implementing Low Impact Design where possible (ie. planted buffers, rain gardens, permeable paving, etc.). For Beach Drive, consider re-evaluating the linear concrete "sea wall" strategy. Wave action mitigation in cities like Vancouver avoid hard lines in favour of softer zones that allow wave action to dissipate. If we are to build a community with resiliency in mid, let us examine how we can work with wave action rather than against it. I'm sure I
11	
12	
13	On demand pedestrian lights along Mosley Street in study area are required (full 3 light signals). They have better visibility than the current pedestrian crosswalk lights.
Total Percent Responses	

Main Street and Beach Area 1&2 Improvements
Municipal Class Environmental Assessment Study
Online Public Engagement – Sept 23 to Oct 7, 2020

TATHAM ENGINEERING

COMMENT SHEET (please print)

1. Please check the category that best describes your interest in the study:

● resident ☐ business owner ☐ agency or authority ☐ other

MAIN STREET

2. There is a need to widen the Main Street road allowance from 20m to 30 m between Beck Street and the Nottawasaga River to accommodate the proposed travel lanes, parking, sidewalks and bicycle facilities. Do you agree with this widening and how it will be implemented (widen 5m on both sides)? ● yes ☐ no

3. A number of configurations have been developed to accommodate the travel lanes, on-street parking, sidewalks and bicycle facilities on Main Street. Which configuration option do you feel is the most appropriate?

☐ Option 1 ● Option 2 ☐ Option 3 ☐ Other (specify below)

Comments

MOSLEY STREET

4. There is a need to widen the Mosley Street road allowance from 13/15m to 23m between the Nottawasaga River and 2nd Street to accommodate the proposed travel lanes, sidewalks and boulevards. Which widening option do you feel is the most appropriate?

☐ Option 1: widen on the north side ☐ Option 2: widen on the south side ● Option 3: widen on both sides ☐ Option 4: realign the road allowance ☐ Other (specify below)

Comments ***Bike laneway should still be included. Many families bike along the roadways and should have dedicated lanes for safety***

5. There is a need to widen the Main Street road allowance from 20m to 23m between 2nd Street and 6th Street to accommodate the proposed travel lanes, sidewalks and boulevards. Do you agree with this widening and how it will be implemented (maintain a straight alignment and balance the widenings on both sides)? ● yes ☐ no

6. A number of configurations have been developed to accommodate the travel lanes, sidewalks and boulevards on Mosley Street. Which configuration option do you feel is the most appropriate?

☐ Option 1 ☐ Option 2 ● Option 3 with bike lanes ☐ Other (specify below)

Comments ***Bike laneway should still be included. Many families bike along the roadways and should have dedicated lanes for safety***

BEACH DRIVE

7. There is a need to widen the Beach Drive road allowance to 20m and a desire to realign/relocate it in response to the recent high water levels, to ensure an adequate public beach area and to help reduce/prevent impacts to adjacent buildings from storm events. Which alignment option do you feel is the most appropriate?

☐ Option 1: maintain existing location ☐ Option 2: shift 7.5m to recover minimum beach area ☐ Option 3: shift 22m to 100-year flood line ● Option 4: shift 44m to no structure flood hazard limit ☐ Other (specify below)

Comments

8. A number of configurations have been developed to accommodate the commercial, pedestrian, cyclist and event needs of Beach Drive. Which configuration do you feel is the most appropriate?

☐ Option 1 ● Option 2 ☐ Option 3 ☐ Other (specify below)

Comments

ROUNDABOUTS

Roundabout control at key intersections is proven to provide a number of benefits including increased traffic capacity and safety levels, and reduced travel delays and environmental impacts. In addition, they afford the opportunity to create a landmark or gateway feature.

9. Do you support the implementation of future roundabouts (traffic signals would be the alternative) at the following locations:

Main Street & River Road W?	Main Street & Stonebridge Blvd?	Main Street & Beck Street?	Mosley Street & Spruce Street?	Mosley Street & 1st Street?	Mosley Street & 3rd Street?
● yes ☐ no	● yes ☐ no	☐ yes ● no	☐ yes ● no	● yes ☐ no	● yes ☐ no

RIVER AVENUE CRESCENT & GLENWOOD DRIVE

The current configuration of River Avenue Crescent and Glenwood Drive is restricted to one-way operations (southbound on River Avenue Crescent and northbound on Glenwood Drive). Given the horizontal alignment of Main Street at River Avenue Crescent, there are restricted sightlines which are of concern from a safety perspective. There are also concerns relating to future traffic operations given the proposed development levels in the area (traffic signals would be required). In this regard, a number of improvement options have been established for both River Avenue Crescent and Glenwood Drive.

10. Which configuration option do you feel is the most appropriate?

- ☐ Option 1: maintain the existing configuration
- ☐ Option 2: maintain the existing configuration + restrict left turns at River Avenue Crescent/River Road East
- ☐ Option 3: convert River Avenue Crescent to 2-way operations + traffic signals at Main Street
- ☐ Option 4: convert River Avenue Crescent to 2-way operations + centre median at Main Street + reverse Glenwood Drive to southbound
- ● Option 5: convert River Avenue Crescent to 2-way operations + centre median at Main Street + convert Glenwood Drive to 2-way
- ☐ Other (specify below)

Comments

11. Please provide any additional comments as appropriate to assist the Town and Project Team.

More crosswalks, medians and speed bumps on Mosely street should be implemented in all options chosen. This will help reduce speed, street racing, and and safety for residents and tourists.

Thank you for your input. Please mail or email your comments by **October 15, 2020** to:

Michael Cullip, P.Eng.
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
(705) 444-2565 x2020
mcullip@tathameng.com

The information on this comment sheet is collected under the authority of the Environmental Assessment Act and will become public information. All comments will be included in the Class Environmental Assessment documentation to be made public at the conclusion of this project.

Please check the space below if you wish your comments to be made anonymously.

● Please withhold my name and address from publication

Main Street and Beach Area 1&2 Improvements
Municipal Class Environmental Assessment Study
Online Public Engagement – Sept 23 to Oct 7, 2020

TATHAM ENGINEERING

COMMENT SHEET (please print)

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MAIN STREET

2. There is a need to widen the Main Street road allowance from 20m to 30m between Beck Street and the Nottawasaga River to accommodate the proposed travel lanes, parking, sidewalks and bicycle facilities. Do you agree with this widening and how it will be implemented (widen 5m on both sides)?

☑ yes ☐ no

3. A number of configurations have been developed to accommodate the travel lanes, on-street parking, sidewalks and bicycle facilities on Main Street. Which configuration option do you feel is the most appropriate?

☐ Option 1 ☑ Option 2 ☐ Option 3 ☐ Other (specify below)

Comments

MOSLEY STREET

4. There is a need to widen the Mosley Street road allowance from 13/15m to 23m between the Nottawasaga River and 2nd Street to accommodate the proposed travel lanes, sidewalks and boulevards. Which widening option do you feel is the most appropriate?

☐ Option 1: widen on the north side ☐ Option 2: widen on the south side ☑ Option 3: widen on both sides ☐ Option 4: realign the road allowance ☐ Other (specify below)

Comments

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Hope to see this improvement started as soon as possible.

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Comments

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We support the smart redevelopment of the area focused on local economic development, tourism and active living for residents and tourists alike. The options presented in the EA study support this vision.

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Comments

Really depends on what development takes place on Main Street since some plans have already been quashed

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Comments

Again, what development will happen here to improve tourism and a desire for residents to visit.

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Better use for walking traffic and events as long as deliveries for businesses is accommodated at rear.

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Comments

Better to prevent flooding issues that ruin businesses + tourism

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Comments

Better use for pedestrian traffic + events – as long as deliveries to local businesses is accommodated at rear.

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Comments

Much better traffic flow if one-ways are eliminated

11. Please provide any additional comments as appropriate to assist the Town and Project Team.

Much depends on what actually gets developed since the DSMP has been severely diluted by current Council. What will attract people to this area if there is no features like a civic square/community hub?

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14 October 2020
Addendum to Item 11 of Comment Sheet Main Street and Beach Area Wasaga Beach prepared by Tatham Engineering.

Comments of Donald Hamlett Civil Engineer (O.I.Q.-Retired.)

Item 7 Beach Drive
Option 1. Recent events have made this unwise.
Option 2. Has the advantage of retaining the maximum amount amount of land for development. Protected by a "sea wall" with run offs at each end back to higher ground perhaps this might gain environmental approval?.
Option 3. Reduces area for development. Due to Climate Change and other causes the "100 year rule" has become somewhat tarnished!
Option 4. This would be the most natural from a visual aspect.
All: Further environmental review may profitably include risk analysis studies, Insurance input, Parks Canada requirements etc. Any of which might lead to a different solution.

Item 9 Roundabouts.
An explanation of possible advantages may have been provided as public knowledge of roundabouts in an urban main street is limited. I have indicated a rejection of all roundabouts listed until such time as a proper comparison with traffic lights is forthcoming. Whilst not necessarily the order of priority, the "Objective" lists:
The needs of pedestrians
The needs of cyclists
The needs of motorists
Current technology in traffic lights provides tailor made solutions for every intersection, taking care of all three of these objectives. It is not shown that experience with "traffic islands/traffic circles/roundabouts etc."would respond to the needs of pedestrians in particular. Even if cyclists use a 2 way track they will enter traffic (in one direction against the flow) in order to access cross roads or travel to the opposite side. Will they travel with vehicles around the roundabout? Clearing snow or accidents could be more difficult if the roundabout is enclosed with a barrier. However a roundabout near the Beach would permit a legal reversal of travel direction ("U turn").

Item 10 River Avenue Crescent and Glenwood Drive

There is not an option listed but it would be possible to maintain the existing configuration and add traffic lights with left hand arrow priority.
A solution to restricted sightlines might be accomplished by obtaining property as part of the road widening and removal of obstructions.

I appreciate this opportunity to make my comments known and understand that this is a very preliminary stage of searching for possible solutions to an area with very different needs during the year. If there are any questions, please call.

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GREAT WORK, LET'S GET THIS PROJECT GOING SOONER THAN LATER!

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☐ no	☐ no	☐ no	☑ no	☑ no	☑ no

RIVER AVENUE CRESCENT & GLENWOOD DRIVE

The current configuration of River Avenue Crescent and Glenwood Drive is restricted to one-way operations (southbound on River Avenue Crescent and northbound on Glenwood Drive). Given the horizontal alignment of Main Street at River Avenue Crescent, there are restricted sightlines which are of concern from a safety perspective. There are also concerns relating to future traffic operations given the proposed development levels in the area (traffic signals would be required). In this regard, a number of improvement options have been established for both River Avenue Crescent and Glenwood Drive.

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- ☐ Option 2: maintain the existing configuration + restrict left turns at River Avenue Crescent/River Road East
- ☐ Option 3: convert River Avenue Crescent to 2-way operations + traffic signals at Main Street + ADD SIDEWALKS & BIKE LANES TO GLENWOOD DRIVE.
- ☐ Option 4: convert River Avenue Crescent to 2-way operations + centre median at Main Street + reverse Glenwood Drive to southbound
- ☐ Option 5: convert River Avenue Crescent to 2-way operations + centre median at Main Street + convert Glenwood Drive to 2-way
- ☑ **Other Option: Add sidewalks and bike lanes to Glenwood while maintaining it as one-way northeast, convert River Avenue Crescent to two-way, and add traffic signals at Main Street.**

Comments If you convert Glenwood to a 2-way street, there would be no consideration given to the socio-economic environment of residents on Glenwood nor to the needs of pedestrians and cyclists who use these two streets. Glenwood Drive is in itself a small hub for residents and tourists, from toddlers to seniors, who attend the public facilities located here: a popular children's playground, the town Library, the Town Hall and tennis court. Pedestrians and cyclists regularly use these streets as a thoroughfare to get to the beach from their neighbourhoods to the south.

11. Converting both streets to 2-way would (i) dump vehicular traffic from Main St. & River Road West onto Glenwood and River Ave. Cres. (ii) would remove sidewalks and bike lanes, further jeopardizing the safety of pedestrians and cyclists (iii) would be costly to taxpayers to widen Glenwood, requiring moving of services and possibly land expropriations (iv) would potentially interfere with an OPP station exit located at the southwest end of Glenwood requiring more use of sirens. Traffic from 3 directions (Access Road, River Ave. Cres and Glenwood) would converge at this exit.

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D. MURDOCH

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TATHAM ENGINEERING

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MAIN STREET

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☒ yes ☐ no

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Comments CLEAR CRITERIA / REGULATIONS WOULD BE REQ'D TO REQUEST PATIO SPACE OVER PARKING ON THE SOUTH SIDE PARKING/PATIO SPACE.

MOSLEY STREET

4. There is a need to widen the Mosley Street road allowance from 13/15m to 23m between the Nottawasaga River and 2nd Street to accommodate the proposed travel lanes, sidewalks and boulevards. Which widening option do you feel is the most appropriate?

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6. A number of configurations have been developed to accommodate the travel lanes, sidewalks and boulevards on Mosley Street. Which configuration option do you feel is the most appropriate?

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9. Do you support the implementation of future roundabouts (traffic signals would be the alternative) at the following locations:

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☑ yes ☑ no Same answer as #4.

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Comments Amenity/patio area should be directly adjacent to the commercial properties not separated by a walkway and should be 4m wide to allow distancing. Center left turn lane should be eliminated as it is a great waste of space. Selective left turn lanes, rest prohibited.

MOSLEY STREET

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Comments The options do not include cost comparisons. This is an important aspect of the decision. i.e. Option 3 may require more buyouts.

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☑ yes ☑ no Same answer as above. Cost??

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Comments SIMILAR TO QUES#3 ABOVE. GET RID OF THE CENTER TURN LANE, EXPAND OUTDOOR RETAIL BY 1.25m ON EACH SIDE. WHERE A TURN LANE IS NEEDED THEN REDUCE THE OUTDOOR RETAIL.

BEACH DRIVE

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Comments LIKE OTHER QUESTIONS THIS SURVEY SHOULD BE RE-ISSUED WITH ESTIMATED COSTS (INCLUDING REQUIRED PROPERTY BUYOUTS). IF OPT 2 & 3 WERE SIMILAR COST I WOULD ACK 3.

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Comments GET RID OF THE CYCLE TRACK. DON'T NEED IT HERE. CYCLE ON MAIN AND MOSLEY. CYCLES HERE CREATE COLLISION RISK WITH PEDESTRIANS. USE THE ALLOCATION FOR OUTDOOR RETAIL/DINING.

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☐ yes ☒ no	☐ yes ☒ no	☒ yes ☐ no	☒ yes SRE #11 ☒ no	☒ yes ☐ no	☑ yes ☐ no

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Comments

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SPRUCE

THE PROCESSING OF VEHICLES INTO BEACH 1 PROV. PARK CAUSES BACKUPS ON JENETTA/ AND OUT TO MOSLEY AND MAIN. THE PROVINCE SHOULD BE LOBBIED TO MOVE THE CHECK IN HUT AND/OR IMPLEMENT AN AUTOMATED LANE THAT WOULD IMPROVE EFFICIENCY. IF THIS IS NOT DONE A TRAFFIC CIRCLE WOULD GET JAMMED UP. AN ALTERNATIVE MIGHT BE TO TURN SPRUCE INTO A BIG ONE WAY CIRCLE BY MAKING MAIN ST GO TO BEACH DRIVE. CLOCKWISE OPERATION WOULD ALLOW TRAFFIC TO BE ABSORBED AND LINE UPS TO BE CONTAINED ON SPRUCE. MAIN FROM MOSLEY TO BEACH COULD BE ONE LANE BUT SPRUCE WOULD BE TWO TO AVOID BACK UP FROM PROVINCIAL PARK

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OTHER: THERE NEEDS TO BE ANOTHER RIVER CROSSING TO REDUCE TRAFFIC LOAD ON MOSLEY AND THE MAIN ST. BRIDGE. VETERANS WAY SEEMS LIKE A GOOD MID POINT.

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mcullip@tathameng.com

The information on this comment sheet is collected under the authority of the Environmental Assessment Act and will become public information. All comments will be included in the Class Environmental Assessment documentation to be made public at the conclusion of this project.

Please check the space below if you wish your comments to be made anonymously.

☐ Please withhold my name and address from publication

Main Street and Beach Area 1&2 Improvements
Municipal Class Environmental Assessment Study
Online Public Engagement – Sept 23 to Oct 7, 2020

TATHAM ENGINEERING

COMMENT SHEET (please print)

1. Please check the category that best describes your interest in the study:

☐ resident ☐ business owner ☐ agency or authority ☐ other

MAIN STREET

2. There is a need to widen the Main Street road allowance from 20m to 30m between Beck Street and the Nottawasaga River to accommodate the proposed travel lanes, parking, sidewalks and bicycle facilities. Do you agree with this widening and how it will be implemented (widen 5m on both sides)?

☐ yes ☐ no

3. A number of configurations have been developed to accommodate the travel lanes, on-street parking, sidewalks and bicycle facilities on Main Street. Which configuration option do you feel is the most appropriate?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Other (specify below)

Comments

MOSLEY STREET

4. There is a need to widen the Mosley Street road allowance from 13/15m to 23m between the Nottawasaga River and 2nd Street to accommodate the proposed travel lanes, sidewalks and boulevards. Which widening option do you feel is the most appropriate?

☐ Option 1: widen on the north side ☐ Option 2: widen on the south side ☐ Option 3: widen on both sides ☐ Option 4: realign the road allowance ☐ Other (specify below)

Comments

5. There is a need to widen the Main Street road allowance from 20m to 23m between 2nd Street and 6th Street to accommodate the proposed travel lanes, sidewalks and boulevards. Do you agree with this widening and how it will be implemented (maintain a straight alignment and balance the widenings on both sides)?

☐ yes ☐ no

6. A number of configurations have been developed to accommodate the travel lanes, sidewalks and boulevards on Mosley Street. Which configuration option do you feel is the most appropriate?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Other (specify below)

Comments

BEACH DRIVE

7. There is a need to widen the Beach Drive road allowance to 20m and a desire to realign/relocate it in response to the recent high water levels, to ensure an adequate public beach area and to help reduce/prevent impacts to adjacent buildings from storm events. Which alignment option do you feel is the most appropriate?

☐ Option 1: maintain existing location ☐ Option 2: shift 7.5m to recover minimum beach area ☐ Option 3: shift 22m to 100-year flood line ☐ Option 4: shift 44m to no structure flood hazard limit ☐ Other (specify below)

Comments

8. A number of configurations have been developed to accommodate the commercial, pedestrian, cyclist and event needs of Beach Drive. Which configuration do you feel is the most appropriate?

☐ Option 1 ☐ Option 2 ☐ Option 3 ☐ Other (specify below)

Comments

ROUNDABOUTS

Roundabout control at key intersections is proven to provide a number of benefits including increased traffic capacity and safety levels, and reduced travel delays and environmental impacts. In addition, they afford the opportunity to create a landmark or gateway feature.

9. Do you support the implementation of future roundabouts (traffic signals would be the alternative) at the following locations:

Main Street & River Road W?	Main Street & Stonebridge Blvd?	Main Street & Beck Street?	Mosley Street & Spruce Street?	Mosley Street & 1st Street?	Mosley Street & 3rd Street?
☐ yes	☐ yes	☐ yes	☐ yes	☐ yes	☐ yes
☐ no	☐ no	☐ no	☐ no	☐ no	☐ no

RIVER AVENUE CRESCENT & GLENWOOD DRIVE

The current configuration of River Avenue Crescent and Glenwood Drive is restricted to one-way operations (southbound on River Avenue Crescent and northbound on Glenwood Drive). Given the horizontal alignment of Main Street at River Avenue Crescent, there are restricted sightlines which are of concern from a safety perspective. There are also concerns relating to future traffic operations given the proposed development levels in the area (traffic signals would be required). In this regard, a number of improvement options have been established for both River Avenue Crescent and Glenwood Drive.

10. Which configuration option do you feel is the most appropriate?

☐ Option 1: maintain the existing configuration

☐ Option 2: maintain the existing configuration + restrict left turns at River Avenue Crescent/River Road East

☐ Option 3: convert River Avenue Crescent to 2-way operations + traffic signals at Main Street

☐ Option 4: convert River Avenue Crescent to 2-way operations + centre median at Main Street + reverse Glenwood Drive to southbound

☐ Option 5: convert River Avenue Crescent to 2-way operations + centre median at Main Street + convert Glenwood Drive to 2-way

☐ Other (specify below)

Comments

11. Please provide any additional comments as appropriate to assist the Town and Project Team.

Thank you for your input. Please mail or email your comments by **October 15, 2020** to:

Michael Cullip, P.Eng.
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
(705) 444-2565 x2020
mcullip@tathameng.com

The information on this comment sheet is collected under the authority of the Environmental Assessment Act and will become public information. All comments will be included in the Class Environmental Assessment documentation to be made public at the conclusion of this project.

Please check the space below if you wish your comments to be made anonymously.

☐ Please withhold my name and address from publication

Michael Cullip

Good morning Charlie

This is Jane Stotesbury. I knew you back when I worked at Schuller Photography and you brought in work from Ainleys.

I see your company is working with the Town of Wasaga Beach regarding development of "our downtown/ beachfront area". Since I have been a taxpayer in Wasaga Beach for over half a century I would like you to revisit the original development design that Duv Levy presented to the Town back in early 2000's. I am familiar with this plan because I was an employee of the OPP in Wasaga Beach and we were invited to discuss such things with the Town.

If the Town had supported the effort and supplied the mere 3 million dollar support requested we would already have a vibrant year round tourist economy in place. Instead we are still stagnant and floundering.....and 13 million dollars poorer.

The Levy plan met all required criteria and then some. It had an amphitheater, beach front cafes and shoppes, a theatre, an indoor ski hill and, if I recall correctly, a bowling alley. It had features that not only attracted tourists but provided features that had been requested by year round/long time residents.

Please revisit that proposal. I am sure the Town must have saved the coloured book/proposal that had been very professionally put together.

Thank you.

Sent from my iPad

Michael Cullip

From: Mike Latimer <m.latimer@wasagabeach.com>
Sent: Friday, September 25, 2020 9:59 PM
To: Michael Cullip
Subject: Fwd: Main drag feedback

Categories: Follow-up

Hi Michael,

See comment below regarding Beach Drive and the EA.

Have a good weekend!

Cheers,

Mike L.

Get Outlook for iOS

[CAUTION: Outside email]

Hello

I want to voice my opinion on removing cars from beach drive.

I strongly disagree with the idea. The main drag IS Wasaga..... Crusing along there is part of the experience.

My grandparents did it.... My parents did it..... I did it and I hope I can do it again.

The main drag should remain open to cars..... It is what it is for.....

Thank you

Get Outlook for Android

Michael Cullip

Hi Michael,

Thanks for acknowledging my email.

It occurred to me that there could also be some issues with storm sewer relocation if Glenwood were to be widened. Since the only direction it could be widened between Lewis and Main is to the south, I wondered how the project would extend the widening west of Lewis.

Widening to the south would pose problems as the sewer grate adjacent to our property is well below the road level and seven feet from the curb. Digging to widen the road to the south would endanger or require removal of mature trees on our lot. It would also necessitate moving the storm sewer grate (which is already only four feet from the property line and several feet below road level) onto our property.

Widening to the north would require the removal of mature trees on town land and pose an increased risk of children running into the street from the playground (although this would solve the issue of sight lines for westbound traffic.)

Could I ask that at least a few of my questions be answered right away so I can assess the possible effects?

1. Is the proposed solution for Glenwood to reverse direction or to widen it and make it two-way?
2. If widening is the proposed solution, would that widening occur only on the south side, or would it be to the north side west of Lewis and the south side east of Lewis?

On Sun, Sep 27, 2020 at 12:20 PM Michael Cullip <mcullip@tathameng.com> wrote:

> Thanks for the input Phi.
>
> Just wanted to confirm receipt and we will certainly review your input and response accordingly.
>
> **Michael Cullip, B.Eng. & Mgmt., M.Eng., P.Eng.**
> Vice President Head Office Operations
>
> **Tatham Engineering Limited**
> 115 Sandford Fleming Drive, Suite 200 | Collingwood | Ontario | L9Y 5A6
> **T** 705-444-2565 x2020 | **C** 705-888-3289 | mcullip@tathameng.com | tathameng.com
>
> 

Thanks for the request for feedback. Here are our thoughts. Please feel free to call if you need to discuss anything.

In answer to your points in the questionnaire:

1) We are residents living at 99 Glenwood Drive, Wasaga Beach.

2) We agree with widening Main but only as the properties become available at a reasonable price or are demolished and replaced by new owners. I don't support the town expropriating all properties on Main.

3) Main Street - we support option 3 as recommended.

4) Mosely Street - we support option 3 widen both sides as recommended

5) Yes, we agree.

6) Mosely Street - we support option 2 as recommended

7) Beach Drive - we support a minimum shift of 7.5 metres as recommended

8) Beach Drive - we support option 2 as recommended.

9) Roundabouts - we support roundabouts on the mainland. We do not support roundabouts north of the bridge on the spit.

10) We do not support any of the considered options.

We take issue with the desire to sidestep solving the sight lines and dangers at the intersection of River Road Crescent and Main. Without fixing the sight lines and without the use of a traffic light at the intersection (something that has been promised for decades) existing dangers to pedestrians and cyclists will be increased rather than solved.

The proposed solution is to make River Road Crescent two-way and to limit turns available to drivers to right-only. The intent also appears to be:

1) To add a physical barrier to vehicles (and perhaps pedestrians and cyclists) between the lanes on Main Street

2) Not to use a traffic light.

I believe a physical barrier would decrease drivers' attention to crossing pedestrian or cyclist traffic (given that they would see there could not be vehicular traffic.) This would be exacerbated by the fact northbound drivers on Main would still be surprised by the (now limited) intersection as they come around the blind corner. While we could add a formal pedestrian crosswalk, drivers are currently making it clear they don't abide by the existing yellow flashing light. Why would we expect them to abide by a similar crosswalk after a blind corner?

The report does not make it clear how pedestrians and cyclists are to be protected at the corner. Perhaps the intent is to dead end them and force them to go to the beach on the south west side of the bridge (against traffic?) However, that would make the comment that cyclists could still use River Road Crescent (but without the protection of a bike lane) meaningless. Bicyclists and pedestrians must be allowed to cross at River Road Crescent and must be protected. In my opinion, the only way to accomplish this is with a traffic light or, at least, the resolution of the sight lines (by redirecting the road and/or clearing obstructing properties) with the addition of a formal crosswalk.

The "pic boards" indicate that the preferred solution for Glenwood Drive is to reverse the flow of traffic. The presentation indicates that the preferred solution is to widen Glenwood and make it two way. I am presuming that the presentation is a later product and that the actual preference is to widen Glenwood and make it two way so it can accommodate commercial (hotel, rental cottage) traffic currently handled by River Road Crescent. This seems counterintuitive. Glenwood is a tiny residential street with residences far closer to the street than is usual. Those cottages have been there since the street had nothing but horses and buggies. Glenwood is already seeing a large increase in traffic due to tourists following their GPS to the town hall instead of following signs directing them to commercial main roads. Now it seems that the town is recommending that, rather than solving the problem with the River Road Crescent intersection, they want to redirect all the traffic that will be prevented from accessing the much larger commercially zoned thoroughfare onto a tiny residential street.

The situation for pedestrians on Glenwood is already precarious. There is no sidewalk and only a poorly protected, narrow paved verge. In stark contrast to the heavily documented and illustrated options for Main, Mosely and Beach Drive, the recommendation(s), format and cost of the choice for Glenwood is glossed over. There is very little property available to the town on this street. One of the two "preferred options" would require widening the travelled area and making the traffic two-way. This would inevitably bring cars in closer proximity to pedestrians. It would be further complicated in the winter as there would no longer be anywhere to put the snow. Existing hydro poles would need to be relocated or the lines buried. Closer proximity to pedestrians would almost certainly require proper sidewalks, further increasing the need for land and further increasing the need for snow removal (rather than plowing.) However, the report is silent on all of this.

Another issue left unaddressed by the report is the increased demand on the Glenwood/Main intersection. If we are anticipating allowing left turns from Main northwest onto Glenwood towards Lewis, all the tourists going to the beach who are currently being guided by their GPS onto Glenwood northeast will simply pile up at the stop sign at Main waiting to turn left. Left turns to the beach will become far more challenging, perhaps bad enough to require another traffic light.

Two-way traffic on Glenwood would also require a three-way stop sign at the intersection of River Road Crescent and Glenwood.

Still, it is unclear which of the two preferred solutions for Glenwood (two-way or reversing flow) is actually preferred. Is it to be one-way the other direction or two-way?

While reversing flow on Glenwood could be done with just changing the signs, it's also not completely foolproof. Due to the forested area on town land within the curve on Glenwood, a driver coming southwest on Glenwood would not be able to see our driveway (at 99 Glenwood) until much later than is safe. Likewise, we would be unable to see those drivers approaching our location. That could be solved by chopping down all the mature trees on the town hall lot within the curve, but that would be unfortunate. That forested area is also adjacent to the children's playground, so removing it to fix the sight line would cause a danger to kids because they would be more likely to run out into the road.

Whichever solution is adopted, it seems clear the intent is to accommodate yet more traffic on Glenwood. Let's not forget the playground and the fact Glenwood is a residential zone. It should not become a new thoroughfare to take the load intended for the commercially zoned River Road Crescent nor should these changes increase traffic in what should be a community protected zone.

All the above machinations are made necessary by the town's reluctance to fix the sight lines and to properly control the intersection of River Road Crescent and Main Street.

I would recommend the installation of a traffic light with left hand turn lanes (as has always been envisioned for the intersection.) The town should acquire the two properties that obstruct drivers' vision and revise the road as necessary. Coincidentally, one of the properties that would be required to do this is currently vacant and is perhaps for sale. Doing this and making River Road Crescent two-way would solve all the issues mentioned above and would not require changes to Glenwood, nor any other infrastructure changes. It would also greatly decrease the likelihood of traffic or pedestrian collisions as inattentive drivers round the blind corner.

In closing, I would ask the following:

1) What is the actual recommendation with respect to changes to Glenwood?

2) What would those changes look like (in the same manner as illustrated for Main, Beach and Mosely?)

3) How much would these changes cost?

4) Have changes to infrastructure (hydro, Bell, gas) been considered? Certainly hydro would need to be relocated.

5) Would expropriations be required on Glenwood? It seems to me that all of the town road allowance would be used and there would be nowhere to put snow in winter. Depending on the solution chosen, we might need to pave or build a sidewalk over the buried infrastructure (that's not ideal.)

6) How would we deal with restricted available space when the snow falls?

7) How would pedestrians and cyclists be accommodated/protected on Glenwood?

8) How would pedestrians and cyclists be accommodated/protected at the intersection of Main and River Road Crescent?

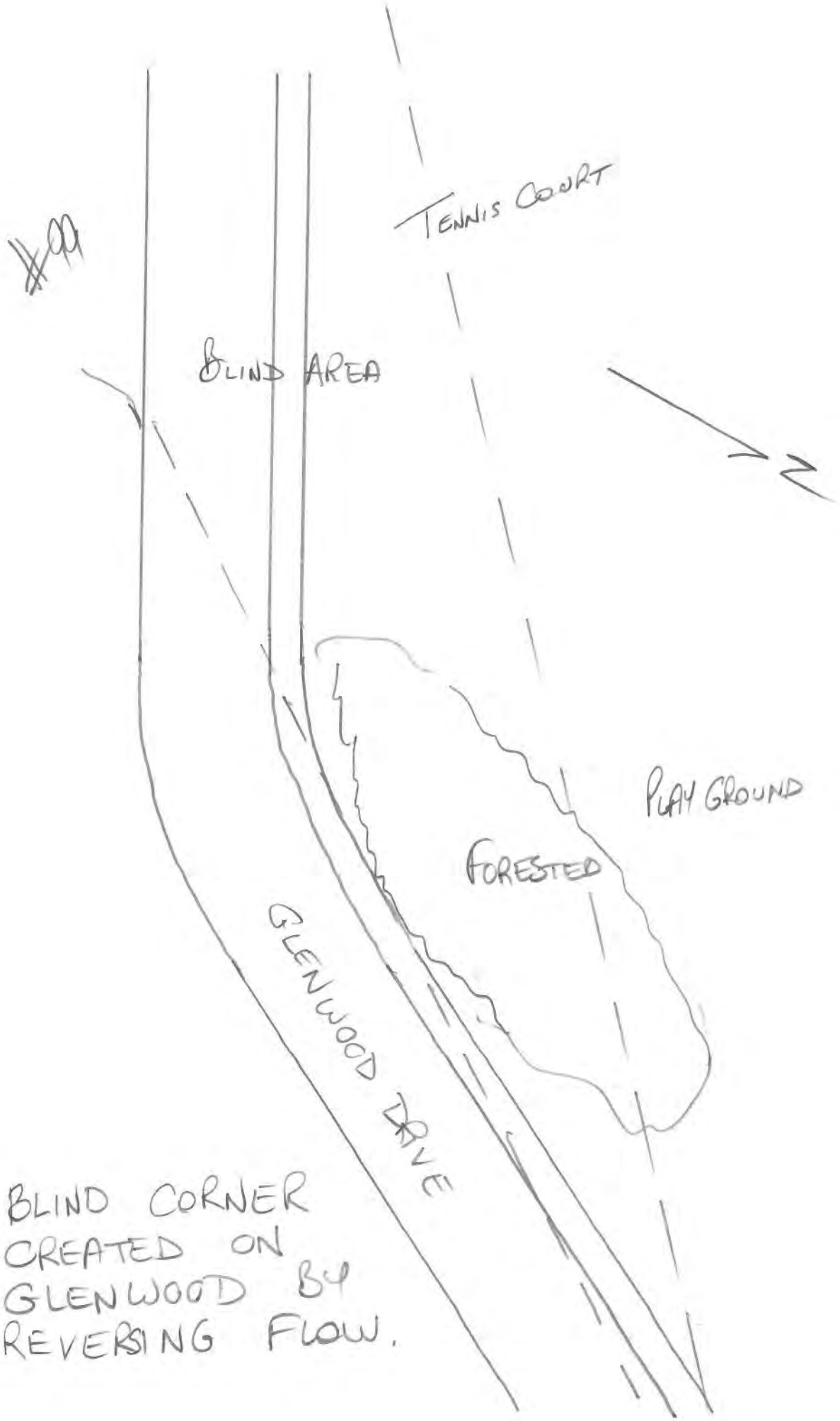
9) What is the vision for required changes to the Glenwood/River Road Crescent intersection? Three-way stop?

10) What analysis has been done surrounding the effect of increased traffic on Glenwood (whether caused by changes envisioned in these reports or the increase currently seen in tourist traffic caused by reliance on GPS?)

11) What analysis has been done surrounding increased difficulty navigating the Glenwood/Main intersection?

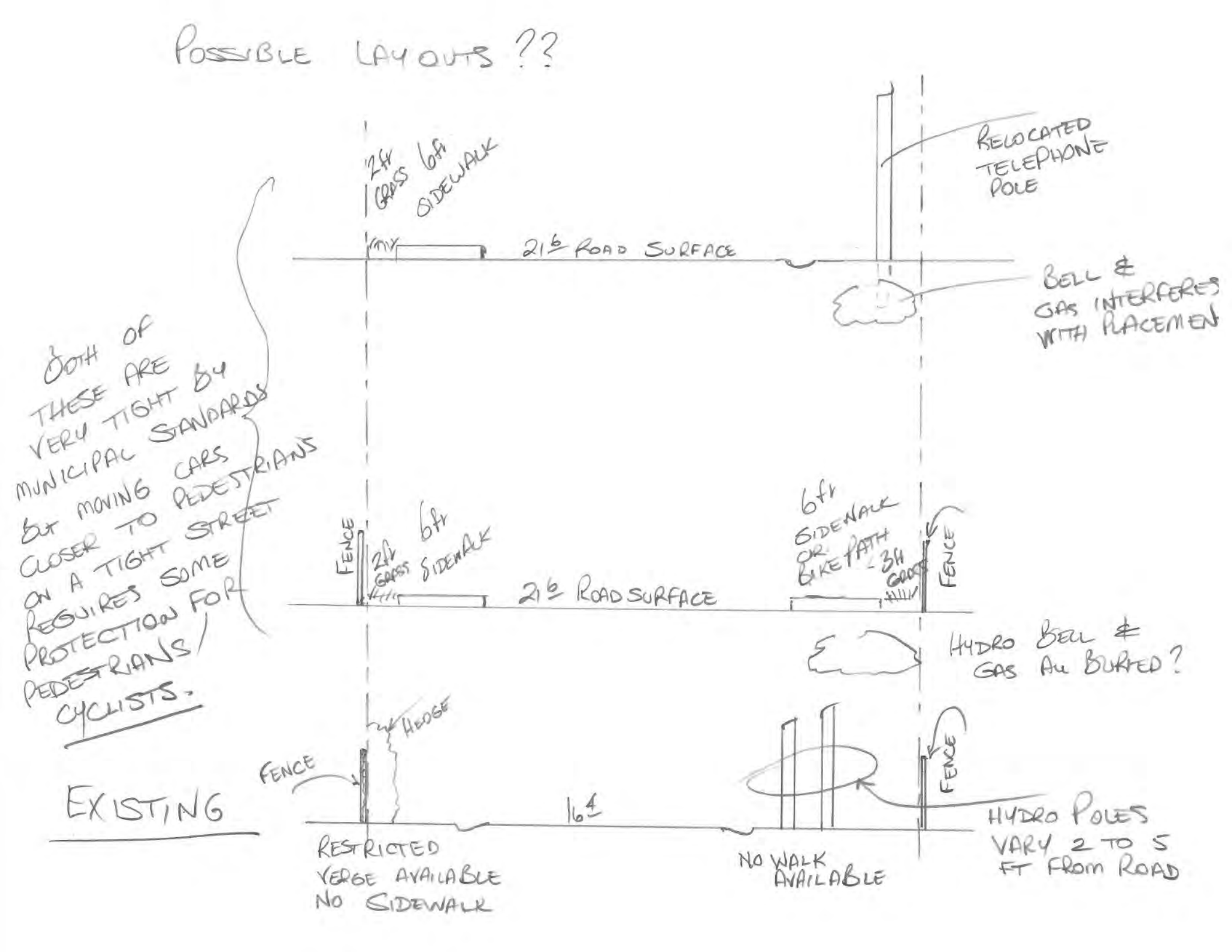
12) Why is there no option in the report to actually fix the main problem at the River Road Crescent/Main intersection (sight lines and controls?)

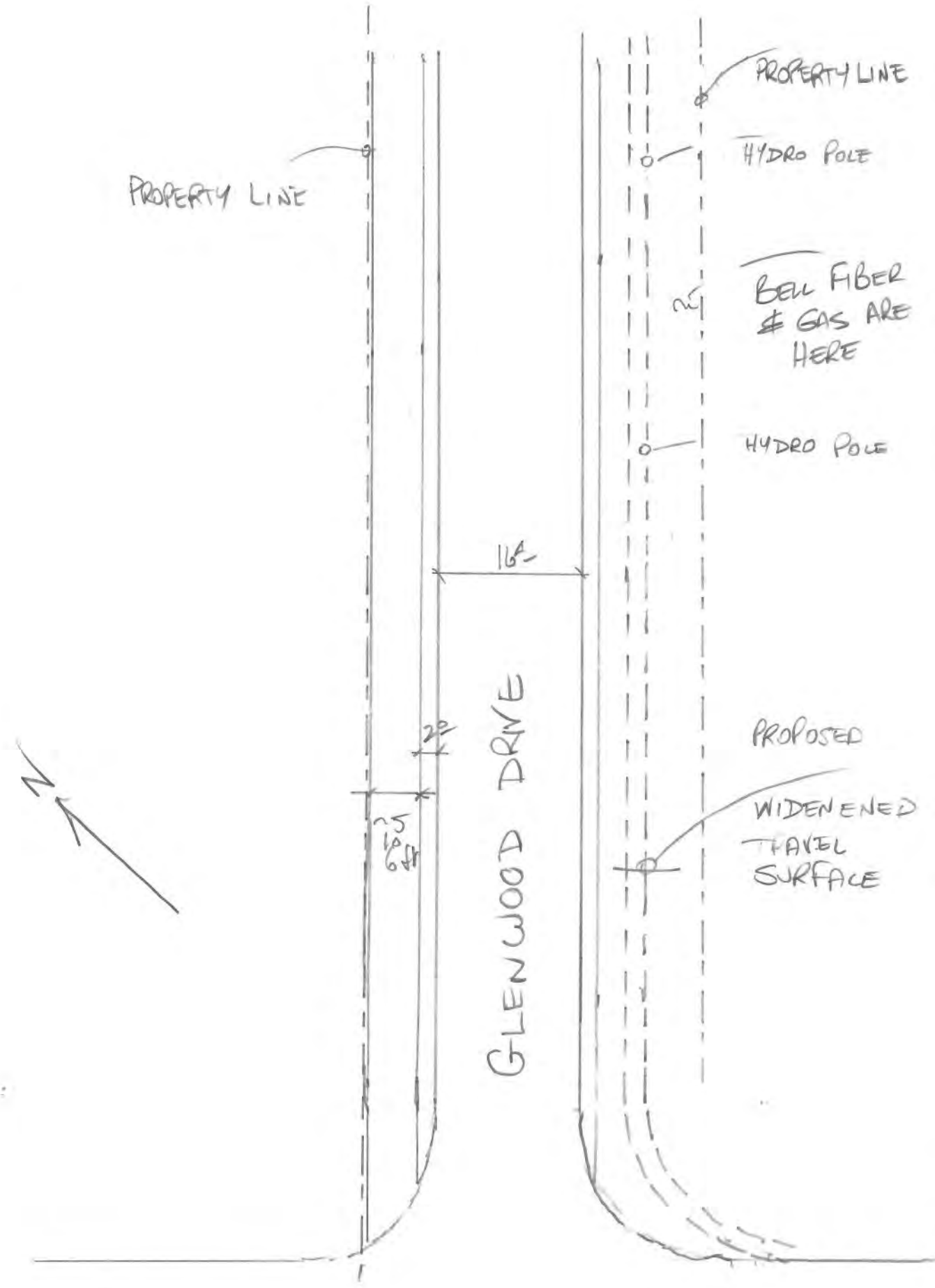
Please see my attachment to further illustrate my concerns surrounding the widening and other changes to Glenwood.

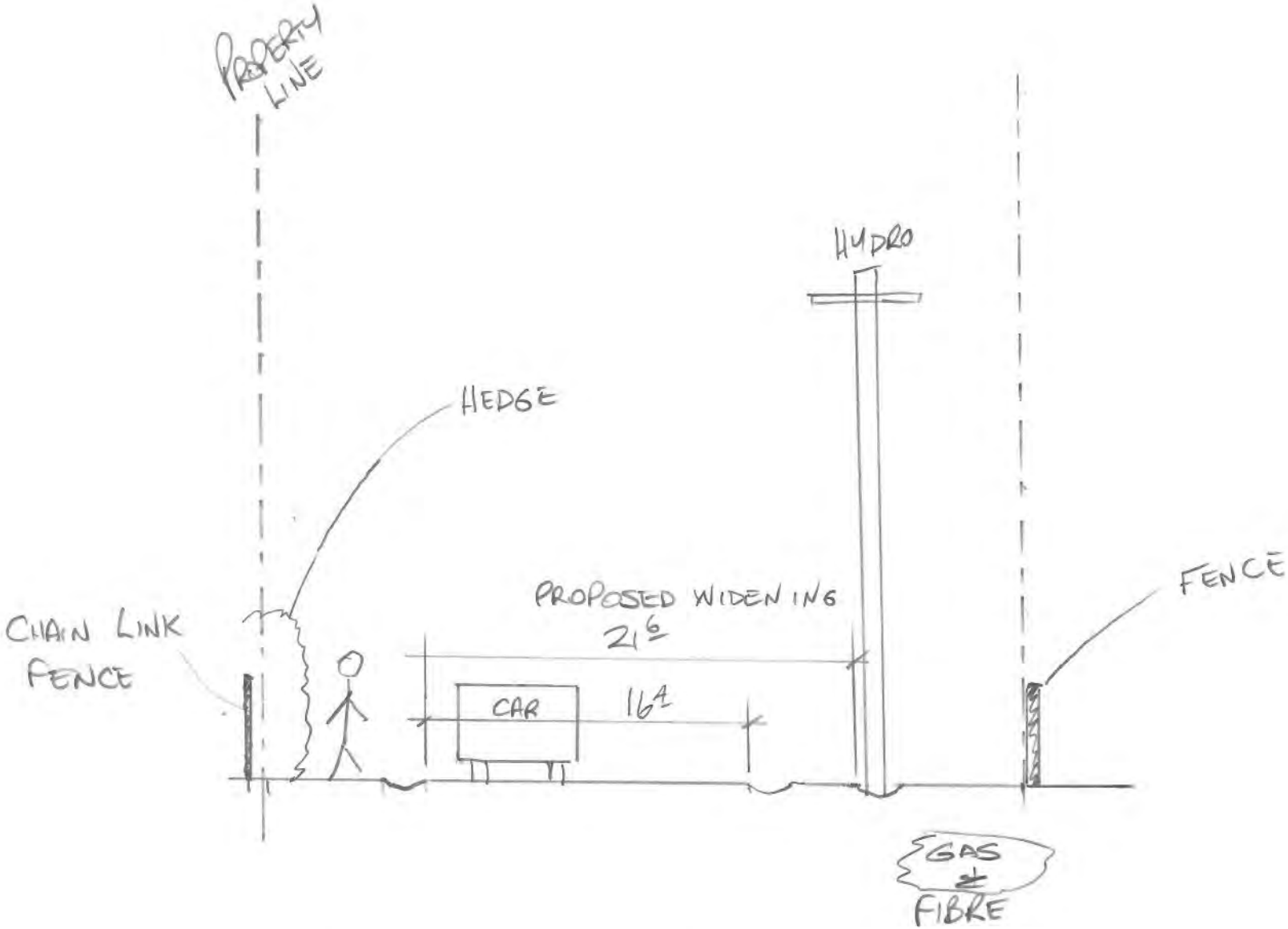


BLIND CORNER CREATED ON GLENWOOD BY REVERSING FLOW.

POSSIBLE LAYOUTS ??




PROPERTY LINE
HYDRO POLE
PROPERTY LINE
BELL FIBER & GAS ARE HERE
HYDRO POLE
16'
2'
~5
10'
6"
GLENWOOD DRIVE
PROPOSED
WIDENED TRAVEL SURFACE
N
LEWIS



CROSS SECTION OF GLENWOOD DRIVE

Michael Cullip

Hi Michael, Mike,

We have left a couple of phone messages asking for clarification on the changes to Glenwood Drive and are hoping to get a response from you prior to the cutoff date for comments.

Please see questions on emails sent Sept 27th and Oct 1st. Let us know if we should be discussing with someone else so we can get this taken care of.

The data in the presentation and picture boards is conflicting. Are you recommending 2 way or reversing the direction to go the other way?

What's the vision for cyclists and pedestrians to access and return from the beach given the elimination of cycle paths and the partial closure of the intersection of Main and River Ave Crescent?

What protection for pedestrians and cyclists is envisioned on Glenwood if the intent is to make Glenwood two way?

What protection is envisioned for cyclists and pedestrians crossing Main at the intersection of Main and River Ave Crescent?

If the intent is to widen Glenwood, what would that look like? You have provided details and pictures of the other streets but not Glenwood. Would widening be on the north or south side?

Thanks so much,

Thanks for the input Phi.

Just wanted to confirm receipt and we will certainly review your input and response accordingly.

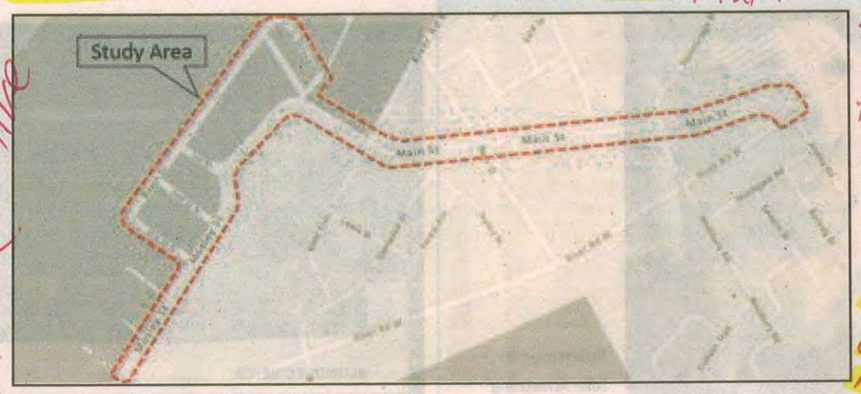
Michael Cullip, B.Eng. & Mgmt., M.Eng., P.Eng.
Vice President Head Office Operations

Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200 | Collingwood | Ontario | L9Y 5A6
T 705-444-2565 x2020 | **C** 705-888-3289 | mcullip@tathameng.com | tathameng.com

Main Street Reconstruction & Beach Area 1&2 Revitalization Municipal Class Environmental Assessment Study Notice of Online Public Engagement

Background

The Town of Wasaga Beach is proposing improvements to the Main Street (River Road West to Mosley Street), Mosley Street (Main Street to 6th Street), Beach Drive and area corridors. The improvements are necessary to facilitate and support future growth within the study area and ensure that future transportation and infrastructure demands can be accommodated. As well as streetscaping options, the Environmental Assessment will identify various alternatives to implementing the needed improvements, with consideration given to road widening, intersection improvements, roundabouts and pedestrian and cycling facilities.



Study Process

The Town is proceeding with a Schedule C Municipal Class Environmental Assessment (EA) to consider and address the impacts associated with the proposed improvements.

Online public engagement is being offered to allow interested members of the public an opportunity to review and provide comment on the alternative design concepts, the recommendations and the next steps in the study process. A recorded presentation and display boards detailing the above, and describing the overall study and the results of the initial Public Information Centre, will be available for viewing on the Town's website (wasagabeach.com) for a 2-week period from Thursday September 24, 2020 to Thursday October 8, 2020. Members of the public are encouraged to submit comments by Thursday October 15, 2020 (a comment sheet is also available on the Town's website).

Recommended Design Concepts

The recommended design concepts consider the long-term transportation needs to support future growth and development of the area. The improvements focus on multi-user solutions and include streetscaping recommendations to revitalize and promote community engagement within the area. The recommended design concepts are as follows:

- Main Street: 3 lanes (1 per direction with a centre turn lane), sidewalks, on-street parking, flexible street zone (south side) and 2-lane cycle track (north side)
- Mosley Street: 3 lanes (1 per direction with a centre turn lane), sidewalks and outdoor retail/patio space on both sides of street
- Beach Drive: closed to vehicle traffic and replace with storefront walkway, event space, 2-lane cycle track, boardwalk and amenity space
- Roundabouts: consider future roundabouts at the Main Street intersections with River Road West, Stonebridge Boulevard and Beck Street
- River Avenue Crescent & Glenwood Drive: convert both street to 2-way operations with turn restrictions at River Avenue Crescent/Main Street

It is noted that these are the recommended solutions only. Upon receipt of agency and public comments, the final preferred solutions will be confirmed and an Environmental Study Report completed for Town review and council endorsement. Following this, the report will be available for public review and comment. A separate notice pertaining to this will be issued at that time.

Project Contacts

Owner
Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, ON L9Z 1A1
Mike Latimer, C.E.T.
Project Coordinator
m.latimer@wasagabeach.com
(705) 429-2540 x2342

Consultant
Tatham Engineering Ltd.
200 Sandford Fleming Dr. #200
Collingwood, ON L9Y 5A6
Michael Cullip, P.Eng
Project Manager
mcullip@tathameng.com
(705) 444-2565 x2020

once you've read this - forward to our attractive mayor.

+ future multimodal requirements
+ center-median landscape boulevard
+ wider sidewalks
+ urban tree planting ↑ blue urban

P.Eng design + OALA + OAA consultants in order to make it beautiful

not just functional!

P.S. why are we selling prime waterfront land - think long term leases. Re-locate the dis-array of commercial into a 3 level single column concrete pier - top level open to sky; 2nd level boutique commercial with enclosed boardwalk - lower level - CONDO units.

P.S.S. why do we have no government dock / marina?

P.S.S.S. where is our industrial park to support tourism community tax base?

Michael Cullip

Categories: Follow-up

Thanks. Appreciate the opportunity. I didn't see any options with a center median. I find those give a more inviting feel for walking, shopping and gathering by splitting the roadway and making it feel less like a throughway and discourages the bad driving behavior like cars doing "donuts" we saw recently on Mosley. They also allow for trees that might get in the way of walkways and bike paths. Left turns would be limited and provided for by a cut out in the median. In The Main Street option 2 example a variation could eliminate parking on the one side (who wants to dine beside parked cars and roadway), make the amenity/patio 4-5m directly adjacent to the retail and have the walkway by the road. I would even suggest that eliminating the street parking altogether on both sides would be a better look and feel or the walkway could wind a little with some retail spaces getting patio and others getting parking to allows for variations of business use. Side streets and lots one block back could supply ample parking and/or an open air shuttle from lots a little further away to accommodate peak summer periods. (There really was a lot about the 2017 Master Plan I liked such as the Town Square at Main and Beck.)

On Oct 4, 2020, at 5:33 PM, Michael Cullip <mcullip@tathameng.com> wrote:

Thanks Rick
Appreciate your continued interest.

Michael Cullip, B.Eng. & Mgmt., M.Eng., P.Eng.
Vice President Head Office Operations

Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200 | Collingwood | Ontario | L9Y 5A6
T 705-444-2565 x2020 | **C** 705-888-3289 | mcullip@tathameng.com | tathameng.com

<image001.png>

<image002.png>

Michael Cullip

From: Pomeroy, Meghan (MECP) <Meghan.Pomeroy@ontario.ca>
Sent: October 15, 2020 12:06 PM
To: Deb Fitzsimmons; Michael Cullip; Mike Latimer
Cc: Fisher, John (MECP); Pomeroy, Meghan (MECP)
Subject: Ontario Parks comments -- Main Street Class EA Public Information Consultation

Categories: Follow-up

Hello Deb, Michael and Mike,

Ontario Parks, Ministry of the Environment, Conservation and Parks (MECP), offers the following comments at this stage of the Wasaga Beach *Main Street and Beach Areas 1 & 2 Municipal Class EA* (schedule C):

Wasaga Beach Provincial Park protects nationally, provincially, and regionally significant natural, cultural, and recreational values. The undertakings as proposed may have direct and indirect impacts on Wasaga Beach Provincial Park related to the park boundary; access for park visitors, staff and equipment; storm water management and water drainage; natural heritage features; as well as beach management (e.g., sand management, detritus management, beach raking). All undertakings within the park, including disposition of park land, are subject to the *Provincial Parks and Conservation Reserves Act,* Class Environmental Assessment for Provincial Parks and Conservation Reserves, and *Environmental Bill of Rights.* Ontario Parks would like to request a meeting with appropriate municipal and consultant staff to discuss the proposals and potential impacts on Wasaga Beach Provincial Park.

Thank you,
Meg

Meghan Pomeroy | A/ Senior Park Planner – Southwest Zone
1350 High Falls Road, Bracebridge, Ontario, P1L 1W9
Cell: (705) 571-1506 E: meghan.pomeroy@ontario.ca W: OntarioParks.com
Ministry of the Environment, Conservation and Parks
Please note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Deb Fitzsimmons <dfitzsimmons@tathameng.com>
Sent: September 23, 2020 2:15 PM
To: Michael Cullip <mcullip@tathameng.com>
Subject: Main Street Class EA Public Information Consultation

Good afternoon,

On behalf of the Town of Wasaga Beach, please see the attached notice regarding stakeholder consultation for the *Main Street and Beach Areas 1 & 2 Class Environmental Assessment*.

Should you have any comments or questions, please do not hesitate to contact us.

Deb Fitzsimmons, Spec. Hons. B.A., B.Ed.
Administrative Assistant

Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200 | Collingwood | Ontario | L9Y 5A6
T 705-444-2565 x2027 | **E** dfitzsimmons@tathameng.com

Ministry of Heritage, Sport, Tourism and Culture Industries

Programs and Services Branch
401 Bay Street, Suite 1700
Toronto, ON M7A 0A7
Tel: 416.786.7553

Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture

Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto, ON M7A 0A7
Tél: 416.786.7553

Ontario

October 7, 2020 EMAIL ONLY

Michael Cullip, P.Eng
Project Manager
Tatham Engineering Ltd.
200 Sandford Fleming Dr. #200
Collingwood, ON L9Y 5A6
mcullip@tathameng.com

MHSTCI File	**:**	**0012010**
Proponent	**:**	**Town of Wasaga Beach**
Subject	**:**	**Notice of Online Public Engagement**
Project	**:**	**Main Street Revitalization & Beach Area 1&2 Revitalization**
Location	**:**	**Town of Wasaga Beach**

Dear Michael Cullip:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of Online Public Engagement for the above-referenced project. MHSTCI's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- Archaeological resources, including land and marine;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources. The recommendations below are for a Schedule C Municipal Class EA project, as described in the notice of study commencement. If any municipal bridges may be impacted by this project, we can provide additional screening documentation as formulated by the Municipal Engineers Association in consultation with MHSTCI.

Project Summary
The Town of Wasaga Beach is proposing improvements to the Main Street (River Road West to Mosley Street), Mosley Street (Main Street to 6th Street), Beach Drive and area corridors. The Town is proceeding with a Schedule C Municipal Class Environmental Assessment (EA) to consider and address the impacts associated with the proposed improvements.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
This EA project may impact archaeological resources and should be screened using the MHSTCI *Criteria for Evaluating Archaeological Potential* to determine if an archaeological assessment is needed. MHSTCI archaeological sites data are available at *archaeology@ontario.ca*. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MHSTCI for review.

Built Heritage and Cultural Heritage Landscapes
The MHSTCI *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether this EA project may impact cultural heritage resources. If potential or known heritage resources exist, MHSTCI recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MHSTCI for review and make it available to local organizations or individuals who have expressed interest in review.

Environmental Assessment Reporting
All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MHSTCI whether any technical cultural heritage studies will be completed for this EA project, and provide them to MHSTCI before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank you for consulting MHSTCI on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, do not hesitate to contact Dan Minkin.

Sincerely,

Joseph Harvey
On behalf of

Dan Minkin
Heritage Planner
Heritage Planning Unit
Dan.Minkin@ontario.ca

Copied to: Mike Latimer, Project Coordinator, Town of Wasaga Beach
Deb Fitzsimmons, Administrative Assistant, Tatham Engineering Limited

Michael Cullip

From: Deb Fitzsimmons
Sent: Tuesday, September 29, 2020 2:02 PM
To: Michael Cullip
Subject: FW: Main Street Class EA Public Information Consultation

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From: Dorton, Peter (MTO) <Peter.Dorton@ontario.ca>
Sent: Tuesday, September 29, 2020 1:21 PM
To: Deb Fitzsimmons <dfitzsimmons@tathameng.com>
Cc: MacKinnon, John (MTO) <John.MacKinnon@ontario.ca>; Blaney, Cameron (MTO) <Cameron.Blaney@ontario.ca>
Subject: FW: Main Street Class EA Public Information Consultation

Hi Deb:

Main Street and Beach Areas 1 and 2 are beyond MTO permit control area.
We have no comments.

Thanks,
Peter Dorton
Senior Project Manager
Highway Corridor Management Section / Central Region Operations
Ministry of Transportation
159 Sir William Hearst Avenue, 7th Floor
Toronto, ON M3M 0B7
Tel. (416) 235 - 4280
E-Mail: peter.dorton@ontario.ca
Web: www.mto.gov.on.ca/english/engineering/management/corridor

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From: Deb Fitzsimmons <dfitzsimmons@tathameng.com>
Sent: September 29, 2020 11:26 AM
Subject: Main Street Class EA Public Information Consultation

Further to the notice circulated last week, we are confirming that all public consultation and engagement material for the *Main Street Reconstruction and Beach Areas 1 & 2 Class EA Study* has been posted on the Town's website for your review and reference.

All files can be found at this location:

https://www.wasagabeach.com/Pages/Beachfront-Development.aspx

With thanks,

Deb Fitzsimmons, Spec. Hons. B.A., B.Ed.
Administrative Assistant

Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200 | Collingwood | Ontario | L9Y 5A6
T 705-444-2565 x2027 | **E** dfitzsimmons@tathameng.com

Appendix P:
Study Completion

Main Street Reconstruction
& Beach Area 1&2 Revitalization
Municipal Class Environmental Assessment Study
Notice of Study Completion

Background

The Town of Wasaga Beach is proposing improvements to the Main Street (River Road West to Mosley Street), Mosley Street (Main Street to 6th Street), Beach Drive and area corridors. The improvements are necessary to facilitate and support future growth within the study area and ensure that future transportation and infrastructure demands can be accommodated.

Class EA Study

To consider the improvements and potential impacts of such on the local environments, a Schedule C Class EA study was completed in accordance with the Municipal Class EA guidelines. The resulting recommendations and preferred solutions consider the long-term transportation needs to support future growth and development of the area and reflect public and agency comment and input, in addition to the requirements of the Town. The improvements focus on multi-user solutions and include streetscaping recommendations to revitalize and promote community engagement within the area.

Preferred Solutions

The preferred solutions are as follows:

- Main Street: ensure a 30m right-of-way with 3 lanes (1 per direction with a centre turn lane), sidewalks, on-street parking, flexible street zone (south side) and 2-lane cycle track (north side)
- Mosley Street: ensure a 23m right-of-way with 3 lanes (1 per direction with a centre turn lane), sidewalks and outdoor retail/patio space on both sides of the street
- Beach Drive: shift Beach Drive 7.5m inland, ensure a 20m right-of-way, close it to vehicle traffic and replace with storefront walkway, event space, 2-lane cycle track, promenade/boardwalk and amenity space
- Roundabouts: consider future roundabouts at the Main Street intersections with River Road West, Stonebridge Boulevard and Beck Street, and the Mosley Street intersection with Spruce Street
- River Avenue Crescent & Glenwood Drive: convert both streets to 2-way operations with turn restrictions at River Avenue Crescent/Main Street and ensure appropriate pedestrian provisions on Glenwood Drive (no property takings along Glenwood Drive)

The Class EA process, the development and evaluation of the options, and derivation of the above noted solutions, have been documented in an Environmental Study Report (ESR). The ESR is available for review on the Town website (www.wasagabeach.com) with a hard copy available for viewing at the Public Works Building (contact Mike Latimer to arrange for a viewing appointment). Interested persons are encouraged to review the report and provide written comments to the Town within the 30-day review period February 3 to March 5, 2021, directed to the project contacts below.

Owner

Town of Wasaga Beach
30 Lewis Street
Wasaga Beach, ON L9Z 1A1
Mike Latimer, C.E.T.
Project Coordinator
m.latimer@wasagabeach.com
(705) 429-2540 x2342

Consultant

Tatham Engineering Ltd.
200 Sandford Fleming Dr. #200
Collingwood, ON L9Y 5A6
Michael Cullip, P.Eng
Project Manager
mcullip@tathameng.com
(705) 444-2565 x2020

If concerns arise regarding this project, which cannot be resolved in discussion with the Town, you may request that the Minister of the Environment Conservation and Parks make an order for the project to comply with Part II of the Environmental Assessment Act (referred to as a Part II Order), which addresses individual environmental assessments. Requests are to be submitted to the Minister, and copied to the Town, before the end of the review period. If there is not a request received by **March 5, 2021**, the project may proceed based on the identified preferred solution.

The Honourable Jeff Yurek
minister.mecp@ontario.ca
Minister of the Environment Conservation and Parks
College Park 5th Floor, 777 Bayt Street
Toronto, Ontario M7A 2J3

This notice issued January 29, 2021