



Miramichi Shores – Phase 4 Subdivision (Formerly Mary Rose Subdivision) Traffic Impact Brief

Paradigm Transportation Solutions Limited

December 2020

Project No.: 200352



18 December 2020
Project: 200352

Miramichi Shores and Land Development
c/o
Brad R. Pryde
10 Collard Way, Box 1725
Port Elgin ON N0H 2C0

Dear Mr. Pryde:

**RE: MIRAMICHI SHORES – PHASE 4 SUBDIVISION (FORMERLY MARY ROSE
SUBDIVISION)
TRAFFIC IMPACT BRIEF**

Background

The proposed development is located in the former Township of Saugeen, Town of Saugeen Shores near the lake shore between Southampton and Port Elgin.

This Traffic Impact Brief (TIB) includes the analysis of existing traffic conditions, a description of the proposed development, traffic forecasts arising from the proposed development, and an evaluation of the impacts of the proposed development on the surrounding transportation system. The proposed development includes 14 new Single-Family Detached Housing units.

Existing Road Network

The proposed development is located at 29 Carter Drive. The closest intersection is Miramichi Bay Road and Collard Way; a three-legged stop-controlled intersection. Miramichi Bay Road connects the nearby towns of Southampton and Port Elgin along the Lake Huron shoreline.

Figure 1 illustrates the lane configuration at the intersection of Miramichi Bay Road and Collard Way and the development location relative to this intersection.

Existing Conditions

Data Collection

Traffic volumes were collected for this site on October 27, 2020. It is expected that the traffic will be greater in the summer months. Accordingly, adjustments to the October traffic volumes accounted for this seasonal variation. Provincial highway data¹ relate Annual Average Daily Traffic (AADT) and Summer Average Weekday Traffic (SAWDT) volumes from 2012 to 2016. These relationships allow the October data to be adjusted to reflect average summer conditions.

The adjustment factor is the annual average ratio of SAWDT to AADT from 2012 to 2016. This factor was 1.35, indicating summer traffic, on average, is 35% higher than October in this area. Applying this factor to the observed October traffic volume data provides a reasonable estimate of typical summer conditions.

Traffic Volumes

The traffic conditions at the intersection of Miramichi Bay Road and Collard Way were analyzed using the adjusted traffic volumes (existing).

Figure 2 illustrates the existing traffic volumes.

Table 1 summarizes the level of service and other performance results. The intersection is currently operating at acceptable levels of service, volume to capacity ratios and delay.

Appendix A contains the detailed Synchro 10 reports.

TABLE 1: BASE YEAR PEAK HOUR TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Miramichi Bay Road and Collard Way	TWSC	LOS Delay V/C Q					< 9	A 9	>		A 0	>	A 0	<	A 1		A 1	2	
PM Peak Hour	Miramichi Bay Road and Collard Way	TWSC	LOS Delay V/C Q					< 9	A 9	>		A 0	>	A 0	<	A 1		A 1	1	

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< - Shared Left-Turn Lane

> - Shared Right-Turn Lane

¹ Ontario Ministry of Transportation Provincial Highway Traffic Volumes 1988-2016



Development Concept

Development Generation

The proposed development consists of 14 single-family detached houses. The Institute of Transportation Engineers (ITE) provides rates and equations² by land use type to forecast the site trip generation. In this instance, LUC 210 (Single family detached housing) was used.

Figure 3 shows the development concept.

Development Trip Distribution and Assignment

Based on the data available in Trip Generation¹, it is forecast that during the AM peak hour, 25% of the trips generated enter the site while 75% exit. During the PM peak hour, 63% of the trips generated enter the site and 37% exit the site.

Table 2 summarizes the forecast site-generated trips. As shown, the proposed development is forecast to generate approximately 15 trips during the AM peak hour and 16 trips during the PM peak hour. These trips are distributed following the existing traffic patterns.

TABLE 2: TRIP GENERATION FROM PROPOSED SUBDIVISION

Land Use	Units	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
LUC 210 - Single-Family Detached Housing	14 Units	*	4	11	15	*	10	6	16
Total Trip Generation			4	11	15		10	6	16

* Regression Equation

Evaluation of Future Traffic Conditions

General Background Growth

The non-site traffic increase is the generalized traffic growth in the Town of Saugeen Shores. The growth rate reflects typical annual increases in the Town and accounts for the general population and employment growth that may occur outside Saugeen Shores. The Town of Saugeen Shores Transportation Master Plan expects a growth rate of 0.5% per year, compounded annually. This growth rate was derived from AADT volumes on Highway 21.

The background road traffic growth for the horizon year of 2025 is expected to increase 2.53% from the 2020 base year.

² Trip Generation Manual - Tenth Edition, Institute of Transportation Engineers, Washington D.C., 2017



2025 Total Traffic Operations

Figure 4 illustrates the forecast 2025 total traffic volumes (background traffic plus the development traffic).

Table 3 summaries the resulting operational analyses.

TABLE 3: 2025 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach															
				Eastbound				Westbound				Northbound				Southbound			
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach
AM Peak Hour	Miramichi Bay Road and Collard Way	TWSC	LOS Delay V/C Q					<	A	>	A		A	>	A	<	A		A
								<	9	>	9		0	>	0	<	1		1
								<	0.04	>			0.03	>		<	0.00		
								<	1	>			0	>		<	0		
PM Peak Hour	Miramichi Bay Road and Collard Way	TWSC	LOS Delay V/C Q					<	A	>	A		A	>	A	<	A		A
								<	9	>	9		0	>	0	<	2		2
								<	0.03	>			0.05	>		<	0.01		
								<	1	>			0	>		<	0		

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< - Shared Left-Turn Lane

> - Shared Right-Turn Lane

Based on the total traffic conditions, all observed movements and approaches at the intersection of Miramichi Bay Road and Collard Way operate at acceptable levels of service.

Appendix A contains the detailed Synchro 10 reports.

Secondary Access

The development is designed as a single cul-de-sac measuring approximately 175 metres from the entrance on Carter Drive to the end of Mary Rose Court. Design standards for the length of a cul-de-sac before a secondary access is required for emergency access varies between municipalities in Ontario. The Town of Saugeen Shores and Bruce County do not have published standards the length of cul-de-sacs. In other jurisdictions in Southwestern Ontario, this standard varies between 106 metres and 300 metres.

The existing neighbourhood served by Collard Way and Carter Drive has a single road which is divided by a centre median. This provides two accesses into the existing neighbourhood from Miramichi Bay Road to the intersection of Collard Way and Carter Drive, where the road splits into a loop. A similar treatment could be implemented on Mary Rose Court to reduce the cul-de-sac length on the side lotted portion Mary Rose Court (from Carter Drive to approximately 75 metres north of Carter Drive). This would reduce the cul-de-sac length to 100 metres and should satisfy length requirements.

Consultation with the Town of Saugeen Shores should be undertaken to determine the need for this design.



Conclusions

Based on the investigations carried out, it is concluded that:

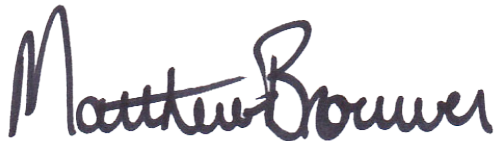
- ▶ Under existing (2020) traffic conditions, the intersection of Miramichi Bay Road and Collard Way operate with acceptable level of service;
- ▶ The proposed development is forecast to generate 15 and 16 new trips during the weekday AM and PM peak hours, respectively; and
- ▶ Under horizon (2025) total traffic conditions, the intersection of Miramichi Bay Road and Collard Way is expected to operate with acceptable level of service.

Recommendations

Based on the conclusions, it is recommended that consideration be given to design the side-lotted portion of Mary Rose Court with a centre median from the intersection with Carter Drive for 75 metres with consultation with the Town of Saugeen Shores.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

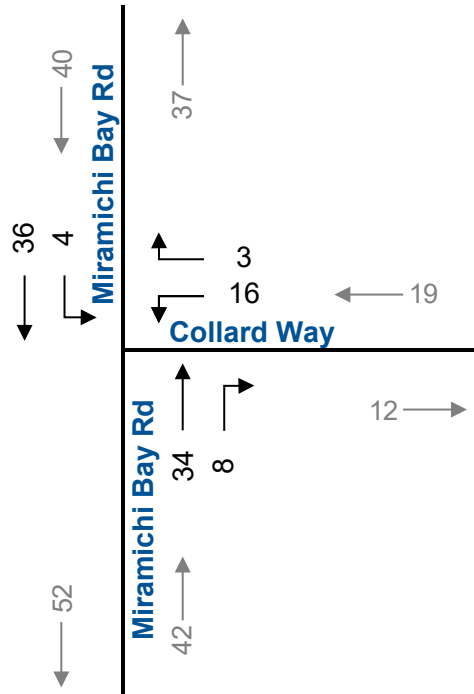


Matt Brouwer
P.Eng.
Senior Project Manager

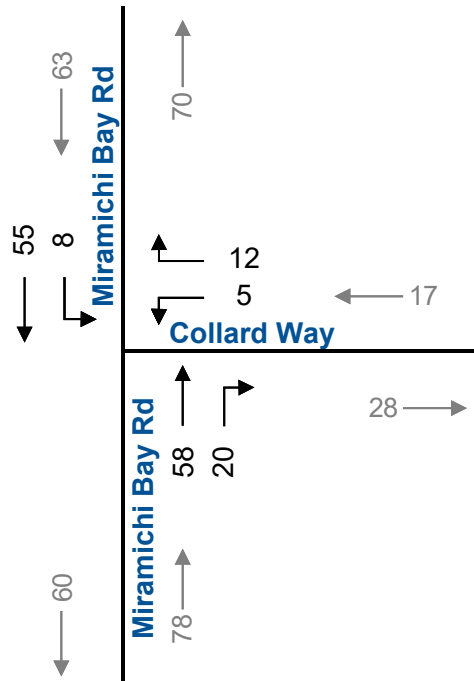


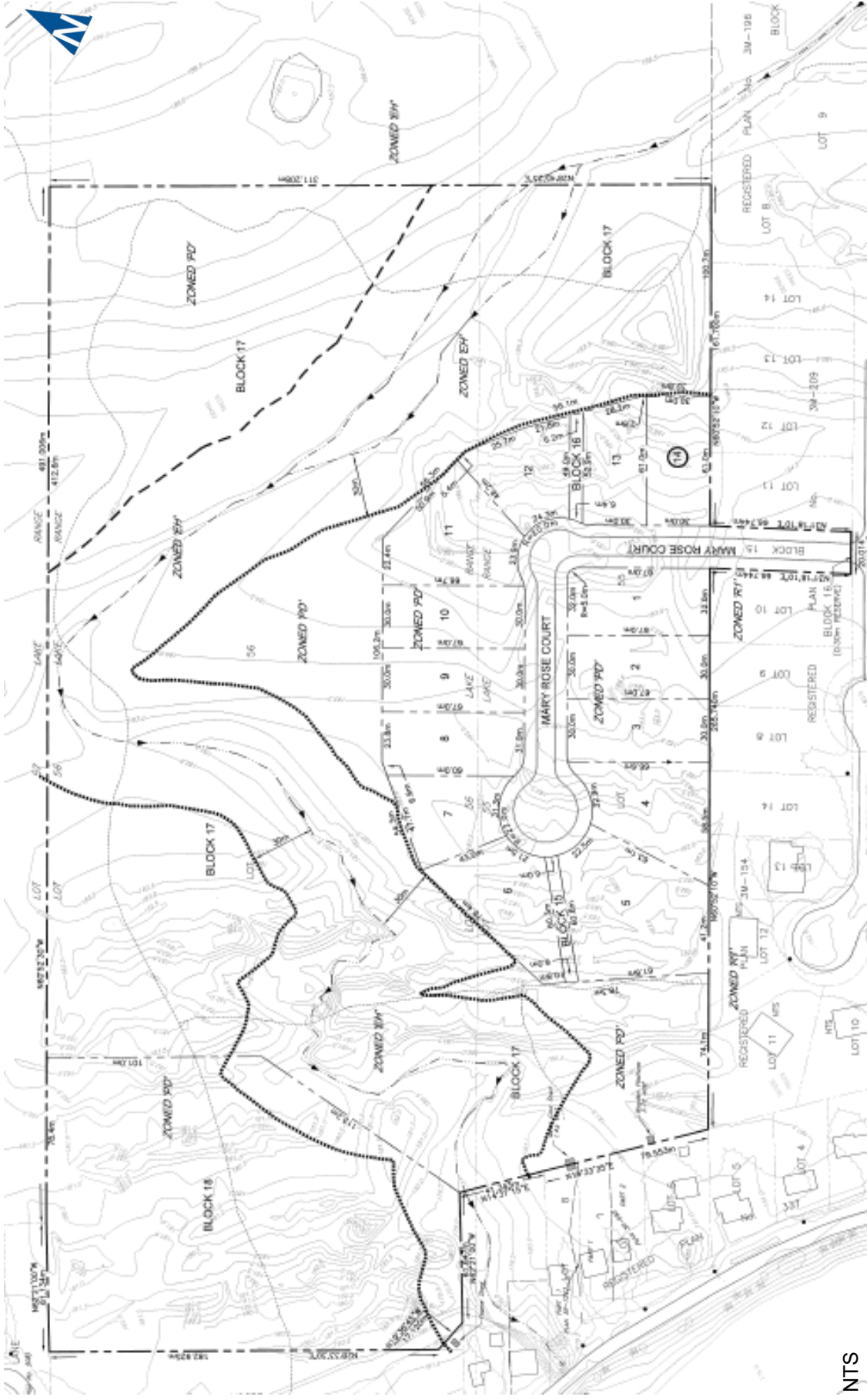


AM Peak Hour



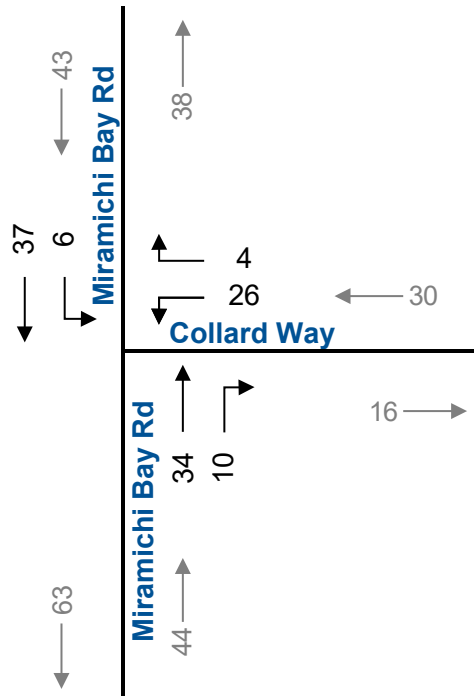
PM Peak Hour



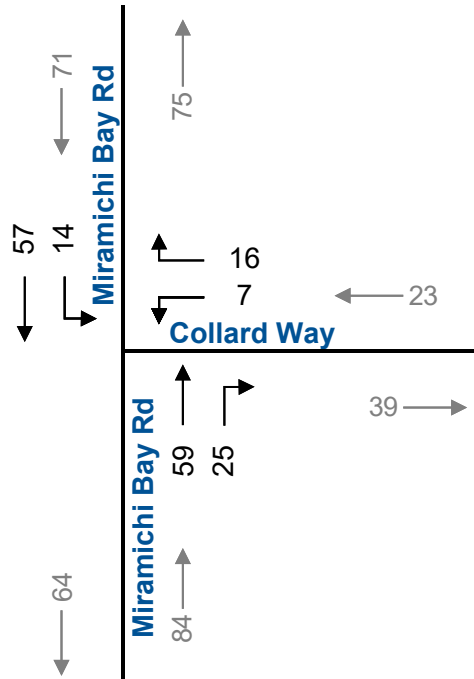


NTS

AM Peak Hour



PM Peak Hour



Appendix A

Traffic Operations Reports



Lanes, Volumes, Timings
3: Collard Way & Miramichi Bay Rd

Existing AM
11-12-2020

	←	↙	↑	↘	→	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Volume (vph)	16	3	34	8	4	36
Future Volume (vph)	16	3	34	8	4	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.980		0.974			
Flt Protected	0.959					0.995
Satd. Flow (prot)	1751	0	1814	0	0	1853
Flt Permitted	0.959					0.995
Satd. Flow (perm)	1751	0	1814	0	0	1853
Link Speed (k/h)	50		50			50
Link Distance (m)	128.5		166.9			146.4
Travel Time (s)	9.3		12.0			10.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	3	37	9	4	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	46	0	0	43
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 15.2% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Collard Way & Miramichi Bay Rd

Existing AM
11-12-2020

	←	↙	↑	↘	→	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Volume (veh/h)	16	3	34	8	4	36
Future Volume (Veh/h)	16	3	34	8	4	36
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	3	37	9	4	39
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	88	42			46	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	88	42			46	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	910	1029			1562	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	20	46	43
Volume Left	17	0	4
Volume Right	3	9	0
cSH	926	1700	1562
Volume to Capacity	0.02	0.03	0.00
Queue Length 95th (m)	0.5	0.0	0.1
Control Delay (s)	9.0	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	0.7
Approach LOS	A		

Intersection Summary

Average Delay 1.9
Intersection Capacity Utilization 15.2% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
3: Collard Way & Miramichi Bay Rd

Existing PM
11-12-2020

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Volume (vph)	5	12	58	20	8	55
Future Volume (vph)	5	12	58	20	8	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.902		0.965			
Flt Protected	0.986					0.994
Satd. Flow (prot)	1657	0	1798	0	0	1852
Flt Permitted	0.986					0.994
Satd. Flow (perm)	1657	0	1798	0	0	1852
Link Speed (k/h)	50		50			50
Link Distance (m)	128.5		166.9			146.4
Travel Time (s)	9.3		12.0			10.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	13	63	22	9	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	85	0	0	69
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 19.6% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Collard Way & Miramichi Bay Rd

Existing PM
11-12-2020

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Volume (veh/h)	5	12	58	20	8	55
Future Volume (Veh/h)	5	12	58	20	8	55
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)	5	13	63	22	9	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	152	74			85	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	152	74			85	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	835	988			1512	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	18	85	69
Volume Left	5	0	9
Volume Right	13	22	0
cSH	940	1700	1512
Volume to Capacity	0.02	0.05	0.01
Queue Length 95th (m)	0.5	0.0	0.1
Control Delay (s)	8.9	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	1.0
Approach LOS	A		

Intersection Summary

Average Delay 1.3
Intersection Capacity Utilization 19.6% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
3: Collard Way & Miramichi Bay Rd

Total AM
11-12-2020

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Volume (vph)	26	4	34	10	6	37
Future Volume (vph)	26	4	34	10	6	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.983		0.969			
Flt Protected	0.958				0.993	
Satd. Flow (prot)	1754	0	1805	0	0	1850
Flt Permitted	0.958				0.993	
Satd. Flow (perm)	1754	0	1805	0	0	1850
Link Speed (k/h)	50		50		50	
Link Distance (m)	128.5		166.9		146.4	
Travel Time (s)	9.3		12.0		10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	4	37	11	7	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	48	0	0	47
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 17.0% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Collard Way & Miramichi Bay Rd

Total AM
11-12-2020

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Volume (veh/h)	26	4	34	10	6	37
Future Volume (Veh/h)	26	4	34	10	6	37
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)	28	4	37	11	7	40
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	96	42			48	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	42			48	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			100	
cM capacity (veh/h)	899	1028			1559	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	48	47
Volume Left	28	0	7
Volume Right	4	11	0
cSH	913	1700	1559
Volume to Capacity	0.04	0.03	0.00
Queue Length 95th (m)	0.9	0.0	0.1
Control Delay (s)	9.1	0.0	1.1
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	1.1
Approach LOS	A		

Intersection Summary

Average Delay 2.7
Intersection Capacity Utilization 17.0% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
3: Collard Way & Miramichi Bay Rd

Total PM
11-12-2020

	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	N	N	S	S
Traffic Volume (vph)	7	16	59	25	14	57
Future Volume (vph)	7	16	59	25	14	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.908		0.960			
Flt Protected	0.984				0.990	
Satd. Flow (prot)	1664	0	1788	0	0	1844
Flt Permitted	0.984				0.990	
Satd. Flow (perm)	1664	0	1788	0	0	1844
Link Speed (k/h)	50		50		50	
Link Distance (m)	128.5		166.9		146.4	
Travel Time (s)	9.3		12.0		10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	17	64	27	15	62
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	91	0	0	77
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 20.4% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Collard Way & Miramichi Bay Rd

Total PM
11-12-2020

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	N	N	S	S
Traffic Volume (veh/h)	7	16	59	25	14	57
Future Volume (Veh/h)	7	16	59	25	14	57
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)	8	17	64	27	15	62
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	170	78			91	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170	78			91	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	813	983			1504	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	91	77
Volume Left	8	0	15
Volume Right	17	27	0
cSH	921	1700	1504
Volume to Capacity	0.03	0.05	0.01
Queue Length 95th (m)	0.7	0.0	0.2
Control Delay (s)	9.0	0.0	1.5
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	1.5
Approach LOS	A		

Intersection Summary

Average Delay 1.8
Intersection Capacity Utilization 20.4% ICU Level of Service A
Analysis Period (min) 15