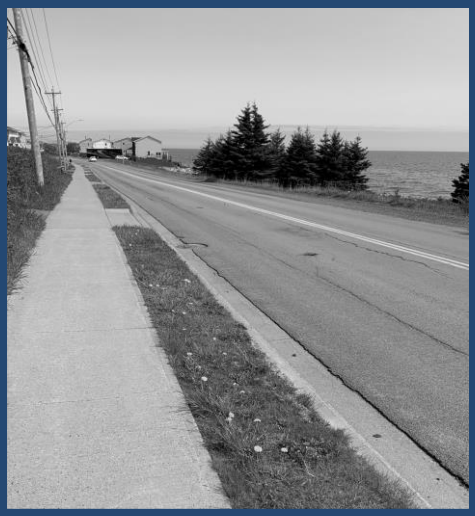
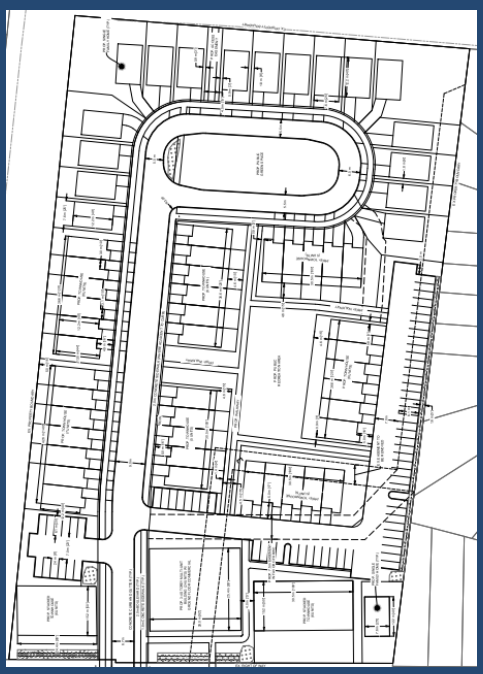
Report

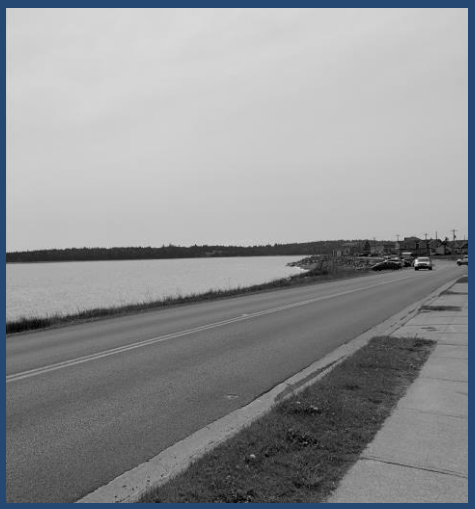


December 16, 2021

Blue Ocean Traffic Impact Study

DesignPoint Project No. 21-166





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Submission to HRM	ECD	September 24, 2021
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Transportation Engineer
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This report was prepared by DesignPoint Engineering & Surveying Ltd. for Blue Ocean Estates Ltd. using the care and skill ordinarily exercised by members of the engineering profession currently practicing under similar circumstances on similar projects in Nova Scotia.

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1.0 INTRODUCTION

DesignPoint Engineering & Surveying Ltd. was engaged to prepare a traffic impact study to support a new residential development located on Shore Drive in Eastern Passage, Nova Scotia. The contents of this study are based on our meeting with Samantha Trask at HRM.

2.0 STUDY AREA

The project site is located at 1818 Share Road (PID 00401125), shown in Figure 1 below. Shore Road at this location is a two-lane paved collector road with gravel shoulders on the water side of the road and a concrete sidewalk on northeast inland side of the road. It has a posted speed of 50 kph.

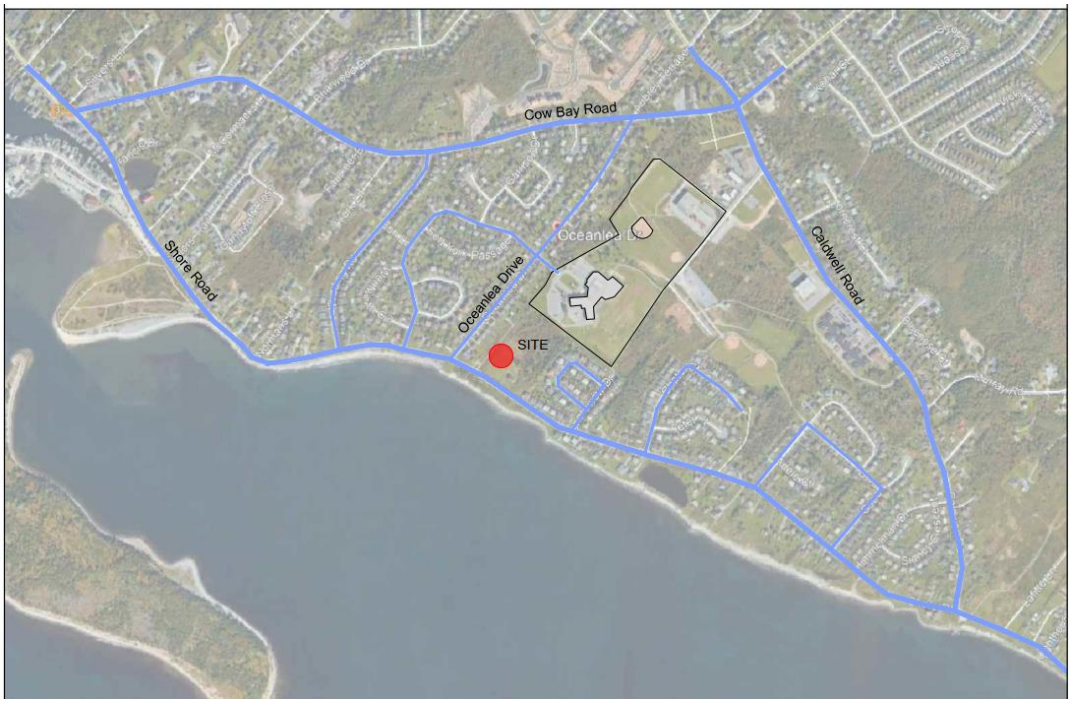


Figure 1 - Project Site Location

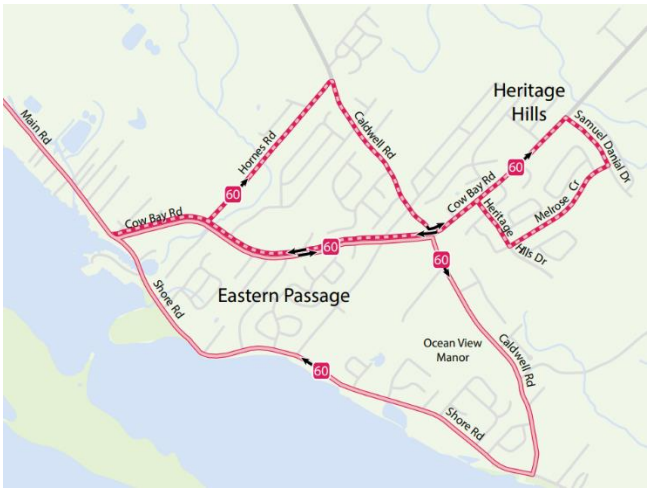
3.0 EXISTING CONDITIONS

3.1 MULTI-MODAL TRANSPORTATION

For pedestrians, a concrete sidewalk is located on the northeastern (inland) side of Shore Road that runs as far south as Caldwell Road where it connects to concrete sidewalk on Caldwell Road. There is a concrete sidewalk along the western side of Oceanlea Drive.

There are no bike facilities on Shore Drive nor is the road identified for future cycling projects on Halifax' current Active Transportation Plan.

This portion of Shore Road is serviced by Halifax Transit Route 60 which travels to the Bridge Terminal. The dashed line indicates the peak route, with the solid line showing the regular route, meaning that the site is within the fully serviced portion of the route. This route will connect residents to the Woodside Ferry Terminal, Alderney Ferry Terminal, and Dartmouth Bridge Transit Terminal.



As part of Halifax's Moving Forward Together Plan (MFTP), this fall it is planned that Route 60 will become Corridor Route 6. MFTP describes a corridor route as the following:

> *The purpose of Corridor Routes is to provide consistent, frequent, service on high demand corridors,connecting residential areas or retail districts with regional destinations like shopping, employment,schools, and services.*
>
> *What differentiates Corridor Routes from other route types is the sustained demand for transit over thecourse of the day, late into the evenings, and on weekends. These routes are well positioned to supportincreased residential density along the corridors which will, in turn, will support increases in potentialridership generated by adjacent land uses. (Halifax MFTP, page 37)*

Both the current Route 60 and future Route 6 provide direction connections between the site and the Woodside Ferry Terminal. MFTP includes 10 proposed Corridor Routes that will service the Regional Centre, offering a high level of service throughout the week including evenings and weekends.

3.2 TRAFFIC DATA COLLECTION

To capture existing traffic volumes, turning movement counts were carried out on May 5th, May 10th and May 11th using Miovision technology. Peak hour (7-9 am, 4-6 pm) counts were collected for the Shore Drive/Caldwell Road intersection. Peak hour counts (7-9 am, 4-6 pm) as well as noon hours (11am-1pm) were collected at Cow Bay Road/Shore Road we well as Shore Road/Oceanlea Drive. Available traffic data for the area was also collected from HRM Traffic Management for the period 2015-2019.

3.3 BASELINE TRAFFIC VOLUME ADJUSTMENT

COVID-19 has shifted the way that many people work and live, and as a result has had an impact on typical travel patterns. In some places, these shifts have resulted in a reduction of peak hour traffic volumes that may be temporary during the pandemic but have the potential to return to regular volumes once daily life returns to a post-pandemic reality. What this means is that traffic volumes collected right now may not be reasonably representative when used for traffic analyses that consider future growth scenarios.

To mitigate this potential for skewed volume counts, the traffic volume data collected in May 2021 was compared to the HRM counts prior to the pandemic. The data collected in May 2021 was compared to HRM

turning movement counts for Shore Road/Caldwell Road from July 2019 as well as a turning movement count for Shore Road/Cow Bay Road collected in May 2017.

It was observed that the largest difference (30%) occurred during the AM peak hour (7-9 am). Given that a high percentage of trips made during the AM peak hour are Home-to-Work trips, this made sense. There was no real difference during midday (11-1 pm), and only a 10% difference during the PM peak hour. To mitigate for this potential under-counting of traffic volumes, observed traffic volumes were factored by 1.3 for the AM peak hour, and 1.1 for the PM peak hour. No adjustment was made for the midday counts. A summary of the adjusted baseline volumes is shown in the following figure.

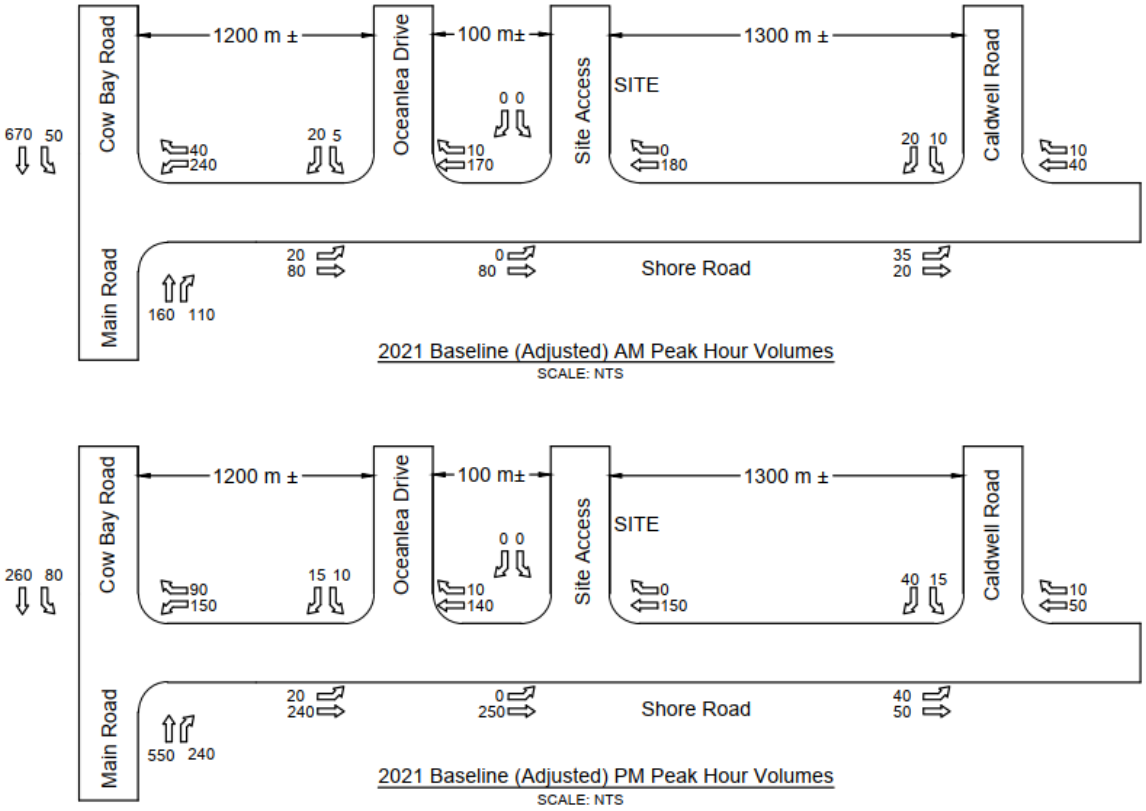


Figure 2 - Baseline Traffic Volumes (Adjusted for COVID Impact)

3.4 EXISTING CONDITIONS OPERATIONAL ANALYSIS

Intersection capacity analysis was carried out to review the existing operations at three existing intersections- Cow Bay Road, Oceanlea Drive, and Caldwell Road. The Synchro 11 software was used to evaluate the performance of the study intersections. The Cow Bay Road intersection was modelled as a signalized intersection. The other two intersections were analyzed as stop controlled intersections. The results for AM and PM peak hours are shown in the following two tables.

Table 1. Intersection Capacity Analysis – 2021 Existing Conditions - AM Peak

Main Road/Cow Bay Road & Shore Road							
AM Peak Hour - 2021 Existing Traffic							
	Shore Road		Main Road		Cow Bay Road		
LOS Criteria	WBL	WBR	NBT	NBR	SBL	SBT	Intersection
Vehicle Count	240	40	160	110	50	670	
Delay (s)	25	6	10		6	12	13
LOS	C	A	B		A	B	B
v/c	0.62	0.1	0.32		0.08	0.64	
95th% Queue (m)	40	5	35		6	91	
Main Road/Cow Bay Road & Shore Road							
AM Peak Hour - 2021 Existing Traffic							
	Shore Road		Shore Road		Oceanlea Drive		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	20	80	170	10	5	20	
Delay (s)	8	-	-	-	10	-	1
LOS	A	-	-	-	A	-	A
v/c	0.02	-	-	-	0.03	-	
95th% Queue (m)	0	-	-	-	0	-	
Main Road/Cow Bay Road & Shore Road							
AM Peak Hour - 2021 Existing Traffic							
	Shore Road		Shore Road		Site		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	0	80	180	0	0	0	
Delay (s)	0	-	-	-	0	-	0
LOS	A	-	-	-	A	-	A
v/c	0	-	-	-	0	-	
95th% Queue (m)	0	-	-	-	0	-	
Main Road/Cow Bay Road & Shore Road							
AM Peak Hour - 2021 Existing Traffic							
	Shore Road		Shore Road		Caldwell Road		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	35	20	40	10	10	20	
Delay (s)	7	-	-	-	9	-	4
LOS	A	-	-	-	A	-	A
v/c	0.03	-	-	-	0.04	-	
95th% Queue (m)	0	-	-	-	0	-	

Table 2. Intersection Capacity Analysis – 2021 Existing Conditions - PM Peak

Main Road/Cow Bay Road & Shore Road							
PM Peak Hour - 2021 Existing Traffic							
	Shore Road		Main Road		Cow Bay Road		
LOS Criteria	WBL	WBR	NBT	NBR	SBL	SBT	Intersection
Vehicle Count	120	80	450	200	80	240	
Delay (s)	23	7	15		5	4	13
LOS	C	A	B		A	A	B
v/c	0.42	0.25	0.64		0.19	0.19	
95th% Queue (m)	23	8	117		7	18	
Main Road/Cow Bay Road & Shore Road							
PM Peak Hour - 2021 Existing Traffic							
	Shore Road		Shore Road		Oceanlea Drive		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	20	240	140	10	10	15	
Delay (s)	8	-	-	-	10	-	1
LOS	A	-	-	-	B	-	A
v/c	0.02	-	-	-	0.04	-	
95th% Queue (m)	0	-	-	-	0	-	
Main Road/Cow Bay Road & Shore Road							
PM Peak Hour - 2021 Existing Traffic							
	Shore Road		Shore Road		Site		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	0	250	150	0	0	0	
Delay (s)	0	-	-	-	0	-	0
LOS	A	-	-	-	A	-	A
v/c	0	-	-	-	0	-	
95th% Queue (m)	0	-	-	-	0	-	
Main Road/Cow Bay Road & Shore Road							
PM Peak Hour - 2021 Existing Traffic							
	Shore Road		Shore Road		Caldwell Road		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	40	50	50	10	15	40	
Delay (s)	7	-	-	-	9	-	4
LOS	A	-	-	-	A	-	A
v/c	0.03	-	-	-	0.07	-	
95th% Queue (m)	0	-	-	-	0	-	

The results indicate that two stop-controlled intersections operate within acceptable operating conditions.[1] The signals at Cow Bay Road meet the v/c ratio requirements but is showing long queues for the Cow Bay Road approach during the AM Peak Hour, and for the Main Road approach during the PM peak hour.

It should be noted that this analysis is based on observed volumes that were adjusted for Covid-19 so it was not possible to confirm these queues through observation. A review of the miovision video for the PM peak hour indicated a maximum queue for the Main Road approach of 8 cars (50 m +\-). The queue for Cow Bay Road approach could not be confirmed because of the camera angle.

Full Synchro analysis results can be provided upon request.

4.0 PROPOSED DEVELOPMENT

4.1 OVERVIEW

The proposed development comprises of 94 residential units and approximately 5000 square feet of commercial space. Residential units are divided into 52 townhouse units, 18 single family units, and a 3-4 story building with 24 units. The commercial space is expected to be a locally owned coffee and/or convenience store.

The proposed site configuration is shown in in Figure 3. There is one proposed access points: a proposed public street intersection with Shore Road on the western portion of the site.

There is concrete sidewalk on either side of the roadway. A pedestrian connection is proposed at the northwestern corner of the site that would connect to the Tallahassee Community School property. We understand that the school has indicated if this pedestrian connection is constructed that they would in turn build a connection from the property line up to the school grounds.

Curb bump outs have been proposed to bookend the on-street parking to assist with traffic calming in the neighbourhood and to create locations with shorter crossing distances to access the central proposed park. The street has a curb-to-curb width of 6.8 m in the areas without on-street parking, and 9.0 m for the sections that accommodate parallel parking on

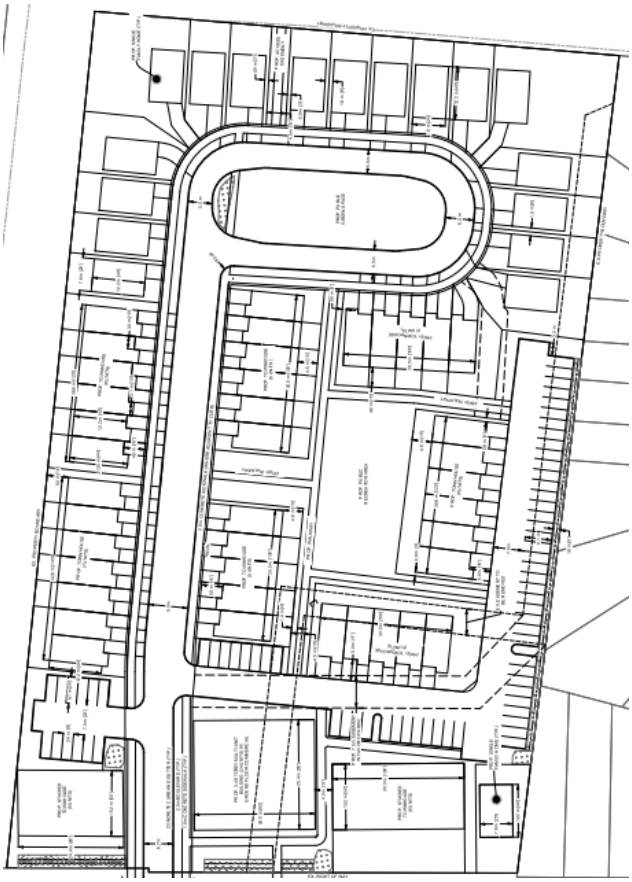


Figure 3: Proposed site configuration

[1] Acceptable operating conditions are defined by HRM's Guidelines for the Preparation of Transportation Impact Studies (8th Revision). The Guidelines require proponents to identify intersections where the overall intersection v/c ratio exceed 0.85, the v/c ratio for through or shared turning movements exceed 0.85, the v/c ratio for protected movements exceed 1.0, and the average delay exceed what is typically unacceptable.

one side. The number of driveways along the western side of the road mean that parallel parking is only feasible on the eastern side of the road.

The proposed public road includes a modified P-loop at the top with a green space in the center of the 'P'. The straight section along the loop have a curb-to-curb width of 5.5 m and the end of the loop has a wider curb-to-curb width of 6.5 m, in order to accommodate larger vehicle movements. The intention is that traffic will be one direction around the loop, with vehicle travelling in the counter-clockwise direction.

4.2 TRIP GENERATION

The ITE Trip Generation Manual method was used to estimate site generated trips. It is estimated that the site will generate 124 AM peak and 152 PM peak hour vehicle trips. We have applied an active transportation and transit mode choice reduction of 14%. This is based on the 2016 JTW data. A 40% pass-by rate has been used for trips generated by commercial use that are completed by existing traffic on Shore Road and new residential trips. Total estimated vehicle trips generate by this new site are shown in the table below.

Table 3: ITE Trip Generation for Blue Ocean Estates

Land Use	Units		Trip Generation Rates						Trips Generated			
			AM Peak			PM Peak			AM Peak		PM Peak	
		Rate	In	Out	Rate	In	Out		In	Out	In	Out
Single-Family Detached Housing (210)	70	0.76	0.26	0.74	1	0.64	0.36		14	39	45	25
Multifamily Housing (Mid-Rise) (221)	24	0.32	0.27	0.73	0.41	0.6	0.4		2	6	6	4
Fast Casual Restaurant (930)	5000 sqft	36.21	0.62	0.38	43.79	0.46	0.54		112	69	101	118
Estimated Site Generated Trips									128	114	151	147
Reduction mode share (14%)									18	16	21	21
Reduction Pass by (40%)									44	39	52	51
Total Estimated Site Generated Trips									**66**	**59**	**78**	**76**
Notes:	1. Trip generation rates from ITE Trip Generation Manual, 10th Edition 2. A 14% mode share reduction, based on 2016 Journey to Work data, has been applied to all trips to account for trips made by walking, cycling and transit. 3. A 40% pass-by rate has been applied to account for commercial trips made by existing traffic and new residential trips.											

4.3 TRIP DISTRIBUTION AND ASSIGNMENT

A review of the 2016 Journey-to-Work data indicates the following for the study area:

Peninsula Halifax	30%
Burnside	22%
Shearwater/Woodside	11%
Intrazonal	7%
Other	30%

Based on this data, it was assumed that 90% of all trips would be to and from the east, and 10% of all trips would be to and from the west.

5.0 SITE ASSESSMENT

5.1 ACCESS REVIEW

A review of the available sightlines along Shore Road was carried out at the two proposed site accesses. The review was based on the guidelines contained in the *Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads*. These guidelines were used to determine the appropriate minimum stopping sight distance (SSD) criteria. The posted speed limit on this section of Shore Road is 50 kph. It has been conservatively assumed that the vehicle operating speeds along this roadway would likely be about 60 kph and this speed has been used as the basis of the sightline review. Characteristic to a roadway that follows a shoreline, Shore Road has a relatively flat grade. For a design speed of 60 kph, the minimum stopping site distance is 85 m. For the public road access, the available driver sight lines to the southwest of the proposed intersection was measured as 144 m and the sight line to the south of the access was 207 m. For the proposed private driveway access, the available driver sight lines to the southwest of the access was measured as 142 m and the sight line to the south of the access was 188 m.

The sight distance in both directions for both accesses exceeds the TAC minimum stopping sight distance (SSD) criteria. We did not identify any concerns with sight distance at the proposed access.

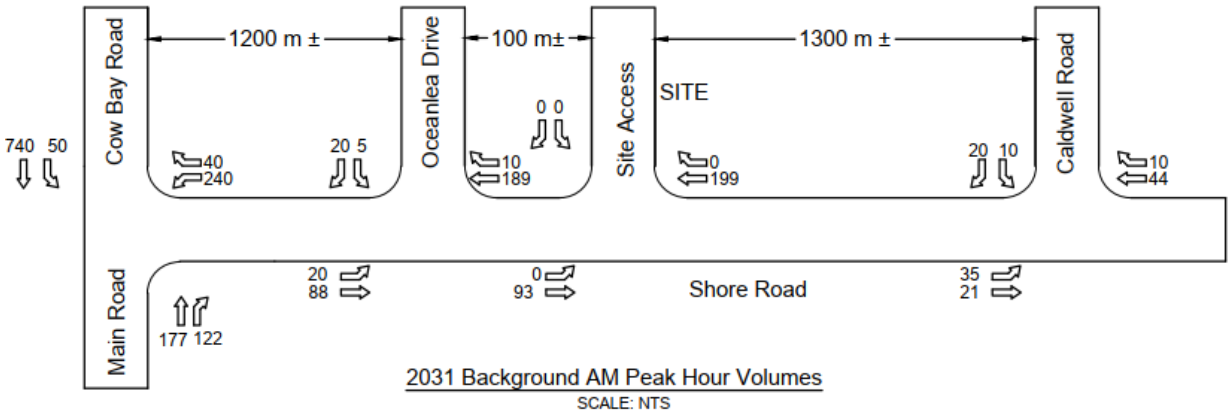
Figure 5 - Looking northwest from proposed public access

Figure 4 - Looking southeast from proposed public access

5.2 FUTURE TRAFFIC VOLUMES

It assumed that full build-out will occur in 5-years so the time horizon for the future growth scenario will be 2026. Based on population and traffic data in the area, a background traffic growth rate of 1% per year has been used.

The following figures present a summary of the traffic volumes for 2021 existing conditions, future 2026 conditions with background growth, and the 2026 conditions with the proposed development. Note that as previously discussed, the 2021 baseline traffic volumes have been adjusted for Covid-19.



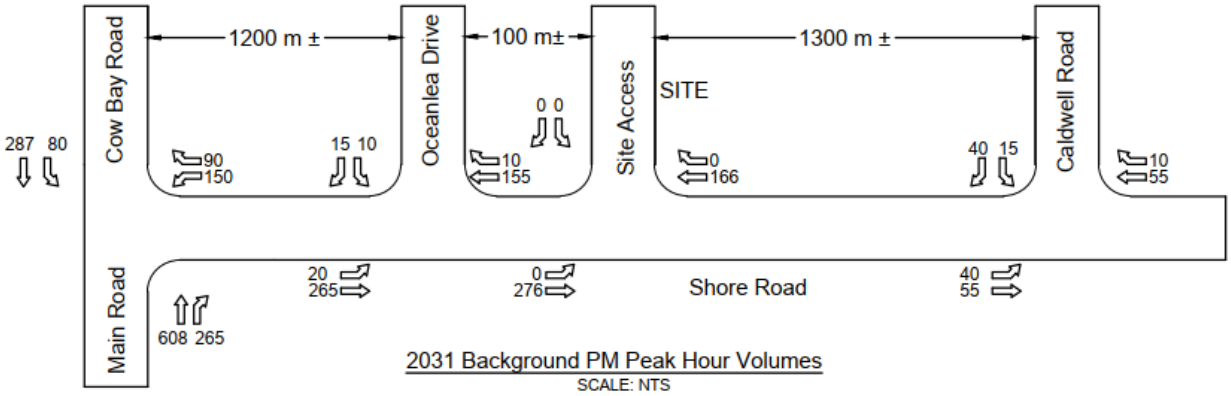


Figure 6 - 2031 Background Traffic Volumes

5.3 OPERATIONAL ANALYSIS

Intersection capacity analysis was carried out to review the impact of the proposed development. Synchro 11 software was used to evaluate the performance of the study intersections. The results are shown in the following tables (for ease of comparison, the tables showing baseline scenarios presented in section 2.3 have been reproduced in this section).

Table 4 - 2031 Background - AM Peak

Main Road/Cow Bay Road & Shore Road							
AM Peak Hour - 2031 Background Traffic							
	Shore Road		Main Road		Cow Bay Road		
LOS Criteria	WBL	WBR	NBT	NBR	SBL	SBT	Intersection
Vehicle Count	240	40	177	122	50	740	
Delay (s)	27	7	10		6	13	14
LOS	C	A	A		A	B	B
v/c	0.64	0.11	0.34		0.09	0.7	
95th% Queue (m)	42	6	38		6	108	
Shore Road & Oceanlea Drive							
AM Peak Hour - 2031 Background Traffic							
	Shore Road		Shore Road		Oceanlea Drive		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	20	88	188	10	5	20	
Delay (s)	8	-	-	-	10	-	1
LOS	A	-	-	-	A	-	A
v/c	0.02	-	-	-	0.04	-	
95th% Queue (m)	0	-	-	-	0	-	
Shore Road & Site							
AM Peak Hour - 2031 Background Traffic							
	Shore Road		Shore Road		Site		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	0	88	199	0	0	0	
Delay (s)	0	-	-	-	0	-	0
LOS	A	-	-	-	A	-	A
v/c	0	-	-	-	0	-	
95th% Queue (m)	0	-	-	-	0	-	
Shore Road & Caldwell Road							
AM Peak Hour - 2031 Background Traffic							
	Shore Road		Shore Road		Caldwell Road		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	35	22	44	10	10	20	
Delay (s)	7	-	-	-	9	-	4
LOS	A	-	-	-	A	-	A
v/c	0.03	-	-	-	0.04	-	
95th% Queue (m)	0	-	-	-	0	-	

Table 5 - 2031 Total AM Peak

Main Road/Cow Bay Road & Shore Road							
AM Peak Hour - 2031 Total Traffic							
	Shore Road		Main Road		Cow Bay Road		
LOS Criteria	WBL	WBR	NBT	NBR	SBL	SBT	Intersection
Vehicle Count	284	46	177	172	57	740	
Delay (s)	28	6	10		6	14	15
LOS	C	A	B		A	B	B
v/c	0.69	0.11	0.41		0.11	0.72	
95th% Queue (m)	50	6	43		7	108	
Shore Road & Oceanlea Drive							
AM Peak Hour - 2031 Total Traffic							
	Shore Road		Shore Road		Oceanlea Drive		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	20	145	238	13	8	20	
Delay (s)	8	-	-	-	11	-	1
LOS	A	-	-	-	B	-	A
v/c	0.02	-	-	-	0.4	-	
95th% Queue (m)	0	-	-	-	0	-	
Shore Road & Site							
AM Peak Hour - 2031 Total Traffic							
	Shore Road		Shore Road		Site		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	60	88	199	6	6	53	
Delay (s)	8	-	-	-	10	-	3
LOS	A	-	-	-	B	-	A
v/c	0.5	-	-	-	0.08	-	
95th% Queue (m)	5	-	-	-	5	-	
Shore Road & Caldwell Road							
AM Peak Hour - 2031 Total Traffic							
	Shore Road		Shore Road		Caldwell Road		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	38	25	47	10	10	23	
Delay (s)	7	-	-	-	9	-	4
LOS	A	-	-	-	A	-	A
v/c	0.03	-	-	-	0.04	-	
95th% Queue (m)	0	-	-	-	0	-	

Table 6 - 2031 Background PM Peak

Main Road/Cow Bay Road & Shore Road							
PM Peak Hour - 2031 Background Traffic							
	Shore Road		Main Road		Cow Bay Road		
LOS Criteria	WBL	WBR	NBT	NBR	SBL	SBT	Intersection
Vehicle Count	150	90	608	265	80	287	
Delay (s)	24	7	29		6	5	21
LOS	C	A	C		A	A	C
v/c	0.48	0.26	**0.87**		0.27	0.24	
95th% Queue (m)	27	9	**183**		7	24	
Shore Road & Oceanlea Drive							
PM Peak Hour - 2031 Background Traffic							
	Shore Road		Shore Road		Oceanlea Drive		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	20	265	155	10	10	15	
Delay (s)	8	-	-	-	11	-	1
LOS	A	-	-	-	B	-	A
v/c	0.02	-	-	-	0.04	-	
95th% Queue (m)	0	-	-	-	0	-	
Shore Road & Site							
PM Peak Hour - 2031 Background Traffic							
	Shore Road		Shore Road		Site		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	0	88	199	0	0	0	
Delay (s)	0	-	-	-	0	-	0
LOS	A	-	-	-	A	-	A
v/c	0	-	-	-	0	-	
95th% Queue (m)	0	-	-	-	0	-	
Shore Road & Caldwell Road							
PM Peak Hour - 2031 Background Traffic							
	Shore Road		Shore Road		Caldwell Road		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	40	55	55	10	15	40	
Delay (s)	7	-	-	-	9	-	4
LOS	A	-	-	-	A	-	A
v/c	0.03	-	-	-	0.07	-	
95th% Queue (m)	0	-	-	-	0	-	

Table 7 - 2031 Total PM Peak

Main Road/Cow Bay Road & Shore Road							
PM Peak Hour - 2031 Total Traffic							
	Shore Road		Main Road		Cow Bay Road		
LOS Criteria	WBL	WBR	NBT	NBR	SBL	SBT	Intersection
Vehicle Count	206	98	608	323	88	287	
Delay (s)	49	9	34		14	6	29
LOS	D	A	C		B	A	C
v/c	0.73	0.29	**0.93**		0.44	0.24	
95th% Queue (m)	59	13	**256**		15	30	
Shore Road & Oceanlea Drive							
PM Peak Hour - 2031 Total Traffic							
	Shore Road		Shore Road		Oceanlea Drive		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	20	331	219	14	14	15	
Delay (s)	8	-	-	-	12	-	1
LOS	A	-	-	-	B	-	A
v/c	0.02	-	-	-	0.06	-	
95th% Queue (m)	0	-	-	-	0	-	
Shore Road & Site							
PM Peak Hour - 2031 Total Traffic							
	Shore Road		Shore Road		Site		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	70	276	166	8	8	68	
Delay (s)	8	-	-	-	10	-	2
LOS	A	-	-	-	B	-	A
v/c	0.06	-	-	-	0.11	-	
95th% Queue (m)	0	-	-	-	0	-	
Shore Road & Caldwell Road							
PM Peak Hour - 2031 Total Traffic							
	Shore Road		Shore Road		Caldwell Road		
LOS Criteria	EBL	EBT	WBT	WBR	SBL	SBR	Intersection
Vehicle Count	44	59	59	10	15	44	
Delay (s)	7	-	-	-	9	-	4
LOS	A	-	-	-	A	-	A
v/c	0.03	-	-	-	0.07	-	
95th% Queue (m)	0	-	-	-	0	-	

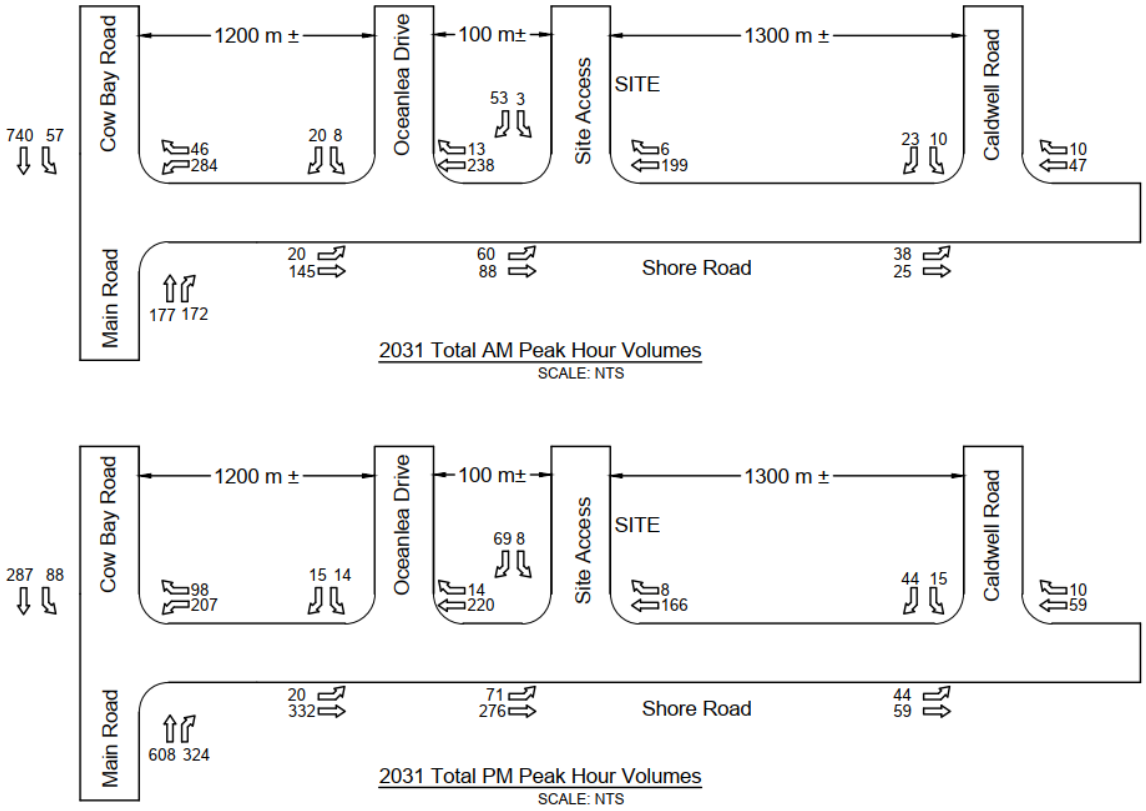


Figure 7 - 2031 Total Traffic Volumes

The operational analysis yields the following observations:

- The stop-controlled intersections analyzed for this study operate within acceptable operating conditions with and without site generated trips.
- The Cow Bay Road signalized intersection currently operates within acceptable operating conditions during the AM and PM peak hours.
- By 2031, the Main Road through approach will exceed the 0.85 v/c criteria during the PM peak hour with and without site generated trips.
- Site generated trips from the proposed development have a minimal impact on traffic operations during the AM peak hours
- Site generated trips increase delay at the intersection of Shore Road and Main Road during the PM peak hour, but delays are still within acceptable limits.

5.4 WARRANT ANALYSIS

A left turning warrant analysis for the proposed site intersection was completed for the 2031 Total Peak AM and PM hour volumes using The Geometric Design Standards for Ontario Highways Manual. For the purposes of this analysis, traffic volumes were not split between the public and private driveways. A design speed of 60 km/h was used. This analysis concluded that a left turn lane is not warranted for the proposed site access.

Similarly, a right turn lane warrant analysis was completed based on guidance from The Ohio Department of Transportation State Highway Access Management Manual. The evaluation indicated that a right turning lane is not warranted for either proposed access point.

The auxiliary lane warrants have been included in Appendix B of this report.

Due to the low traffic volumes, a signal warrant analysis was not completed for the proposed site access or for the nearby intersection of Shore Road and Oceanlea Drive

6.0 SUMMARY

The following provides a summary of the results of this traffic study:

- Traffic volumes collected in May 2021 were believed to be slightly depressed due to modified travel patterns resulting from COVID-19 health pandemic. To mitigate this impact a factor of 1.3 was applied to AM Peak hour volumes and a factor of 1.1 was applied to PM peak hour volumes.
- Based on ITE trip generate rates, the proposed development is estimated to generate 124 new AM peak hour trips and 152 new PM peak hour trips.
- Analysis of these traffic volumes has found that neither turning lanes nor traffic signals will be warranted at the proposed site intersection.
- The direct connection between the site and the Woodside Ferry via route 60 (and MFTP route 6) provides an attractive alternative to traveling to Downtown Halifax by car.
- Operation analysis using Synchro 11 software was performed to review impact of proposed development and found no major operation concerns.

7.0 RECOMMENDATIONS

The following recommendations have been prepared based on the findings of this study:

- No upgrades are required for existing infrastructure to accommodate trips generated by the proposed development.
- Any modifications to the geometry of the existing roadway should be designed and constructed following HRM and TAC design guidelines.
- All signage and pavement markings within the proposed public road will be subject to approval by HRM Traffic Authority.

APPENDIX A – TRAFFIC VOLUME COUNT DATA

Turning Movement Count

Intersection: Shore Road & Oceanlea Drive, Eastern Passage

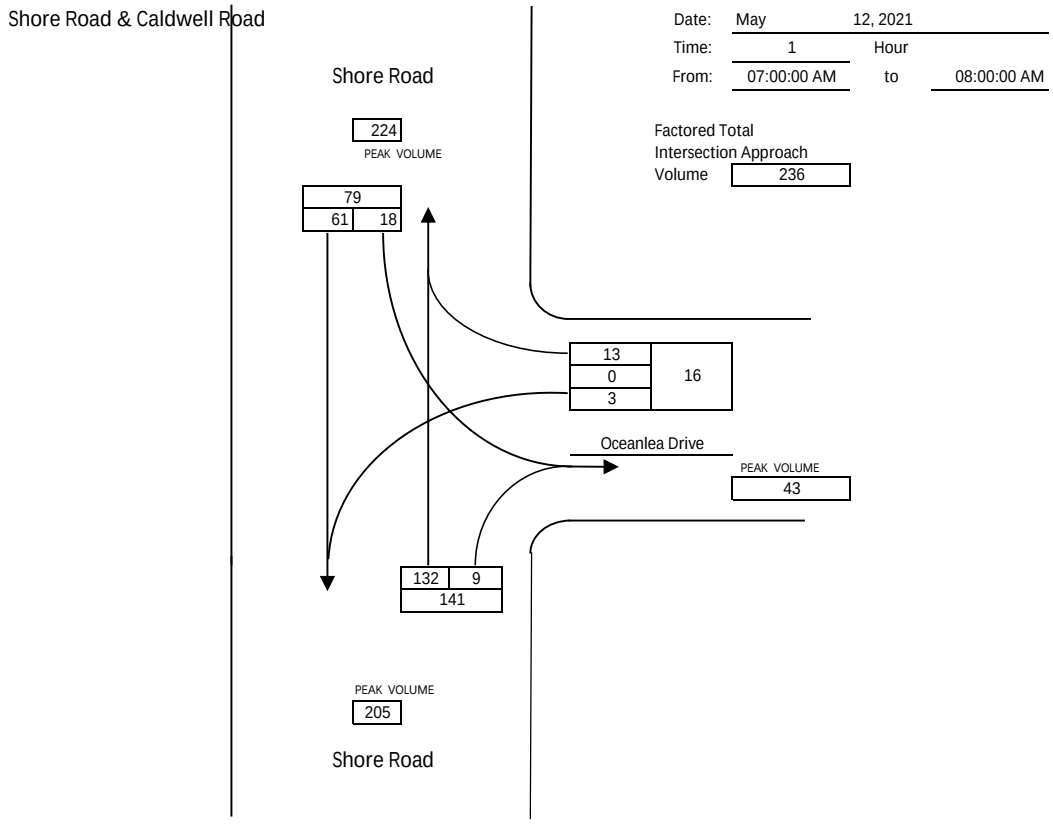
Date: May 12, 2021 Data collected by: Miovision

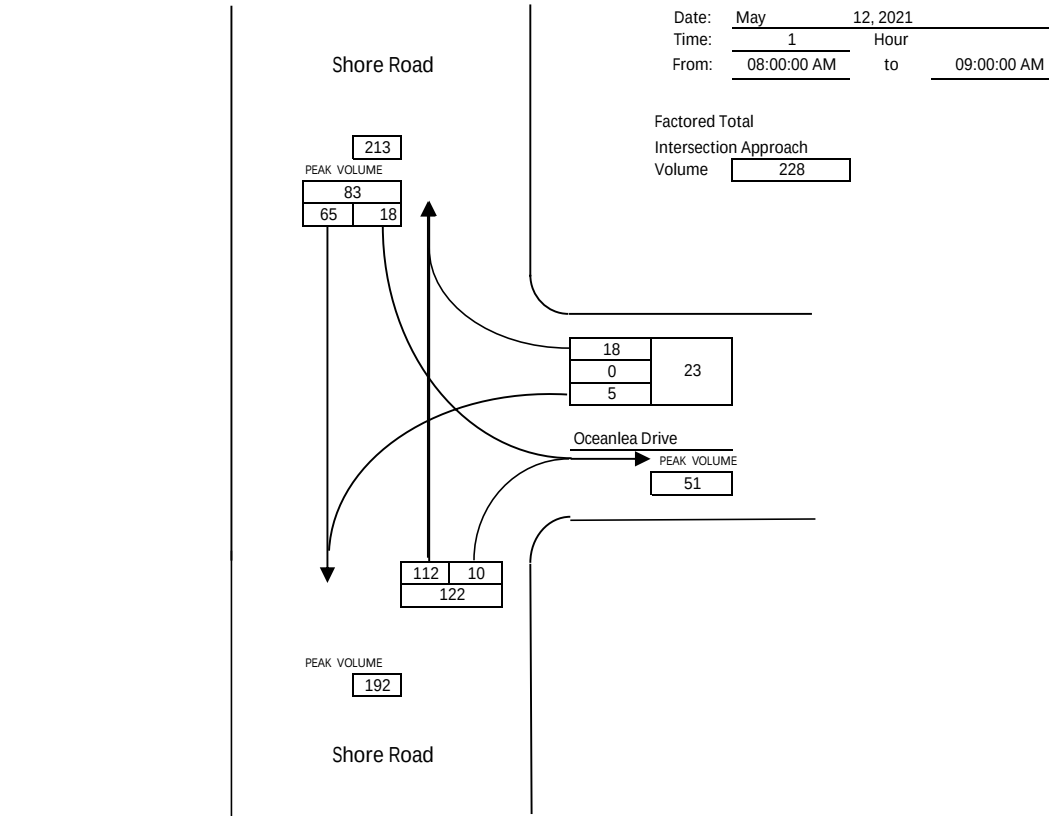
STREET:		Oceanlea Drive			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
07:00 AM	07:15 AM	0		3	1	6			38	3	51
07:15 AM	07:30 AM	1		6	2	18			29	3	59
07:30 AM	07:45 AM	0		2	7	19			41	2	71
07:45 AM	08:00 AM	2		2	8	18			24	1	55
TOTAL		3	0	13	18	61	0	0	132	9	236
PEAK		16			79			141			
15 MIN PEAK		7			26			43			
PEAK HOUR FACTOR		2.29			3.04			3.28			
TWO WAY TOTALS		43			224			205			FACTOR
											1
											236

		Oceanlea Drive			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
08:00 AM	08:15 AM	2		4	5	18			28	1	58
08:15 AM	08:30 AM	1		4	2	16			28	3	54
08:30 AM	08:45 AM	2		4	4	19			25	4	58
08:45 AM	09:00 AM	0		6	7	12			31	2	58
TOTAL		5	0	18	18	65	0	0	112	10	228
PEAK		23			83			122			
15 MIN PEAK		6			23			33			
PEAK HOUR FACTOR		3.83			3.61			3.7			
TWO WAY TOTALS		51			213			192			FACTOR
											1
											228

Vehicular Graphic Summary Sheet

Intersection: Shore Road & Oceanlea Drive, Eastern Passage





Turning Movement Count

Intersection: Shore Road & Oceanlea Drive, Eastern Passage

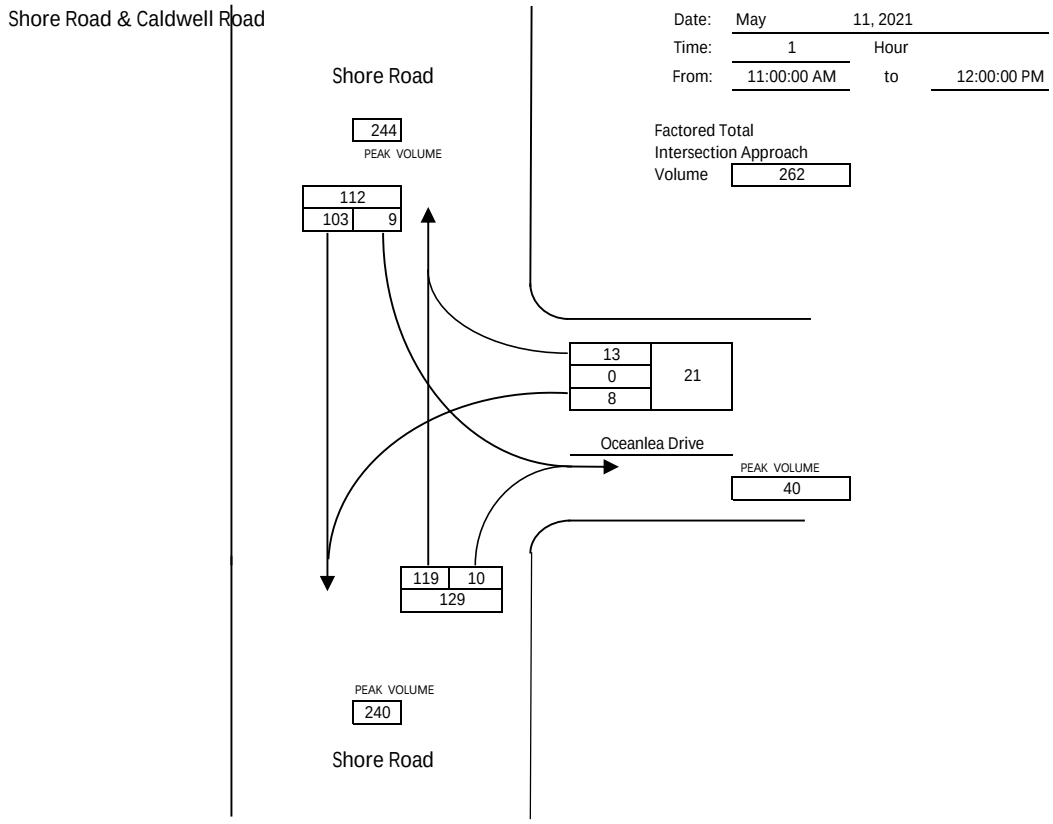
Date: May 11, 2021 Data collected by: Miovision

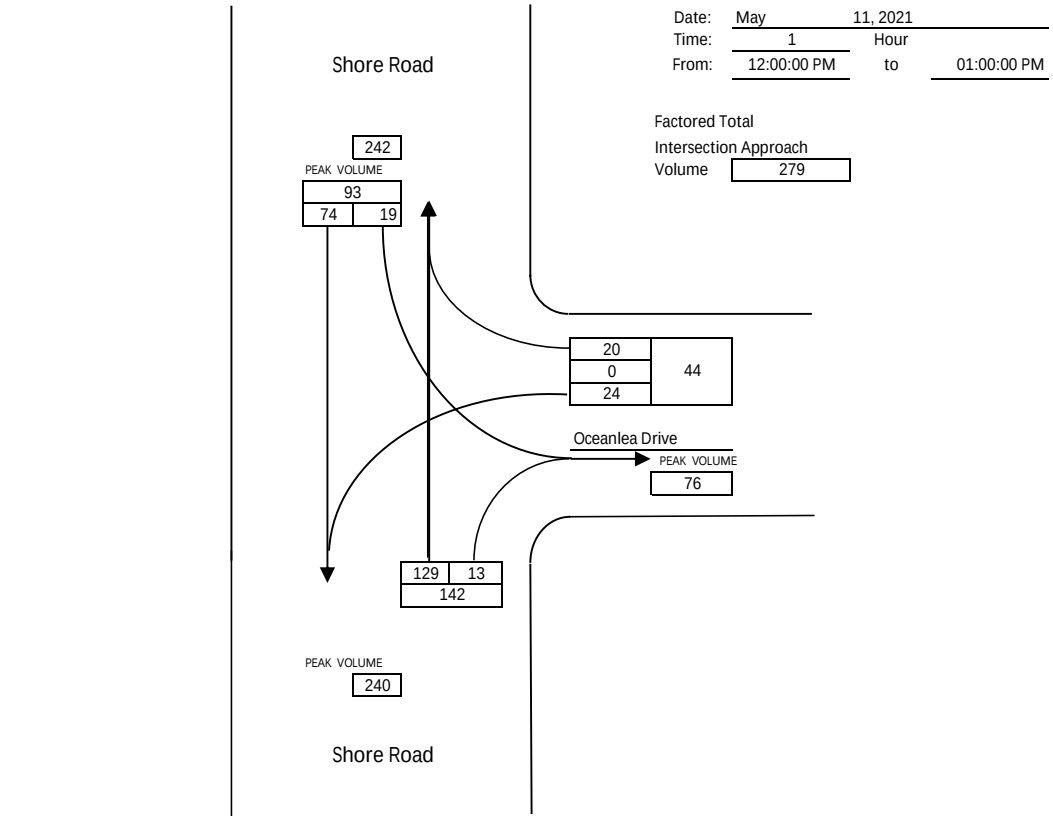
STREET:		Oceanlea Drive			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
11:00 AM	11:15 AM	1		3	2	29			29	2	66
11:15 AM	11:30 AM	4		3	2	24			34	0	67
11:30 AM	11:45 AM	0		1	4	23			29	1	58
11:45 AM	12:00 PM	3		6	1	27			27	7	71
TOTAL		8	0	13	9	103	0	0	119	10	262
PEAK		21			112			129			
15 MIN PEAK		9			31			34			
PEAK HOUR FACTOR		2.33			3.61			3.79			
TWO WAY TOTALS		40			244			240			FACTOR
											1
											262

TIME:		Oceanlea Drive			Shore Road						
		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
12:00 PM	12:15 PM	6		8	2	14			31	6	67
12:15 PM	12:30 PM	6		4	6	18			32	3	69
12:30 PM	12:45 PM	3		8	6	22			28	3	70
12:45 PM	01:00 PM	9		0	5	20			38	1	73
TOTAL		24	0	20	19	74	0	0	129	13	279
PEAK		44			93			142			
15 MIN PEAK		14			28			39			
PEAK HOUR FACTOR		3.14			3.32			3.64			
TWO WAY TOTALS		76			242			240			FACTOR
											1
											279

Vehicular Graphic Summary Sheet

Intersection: Shore Road & Oceanlea Drive, Eastern Passage





Turning Movement Count

Intersection: Shore Road & Caldwell Road, Eastern Passage

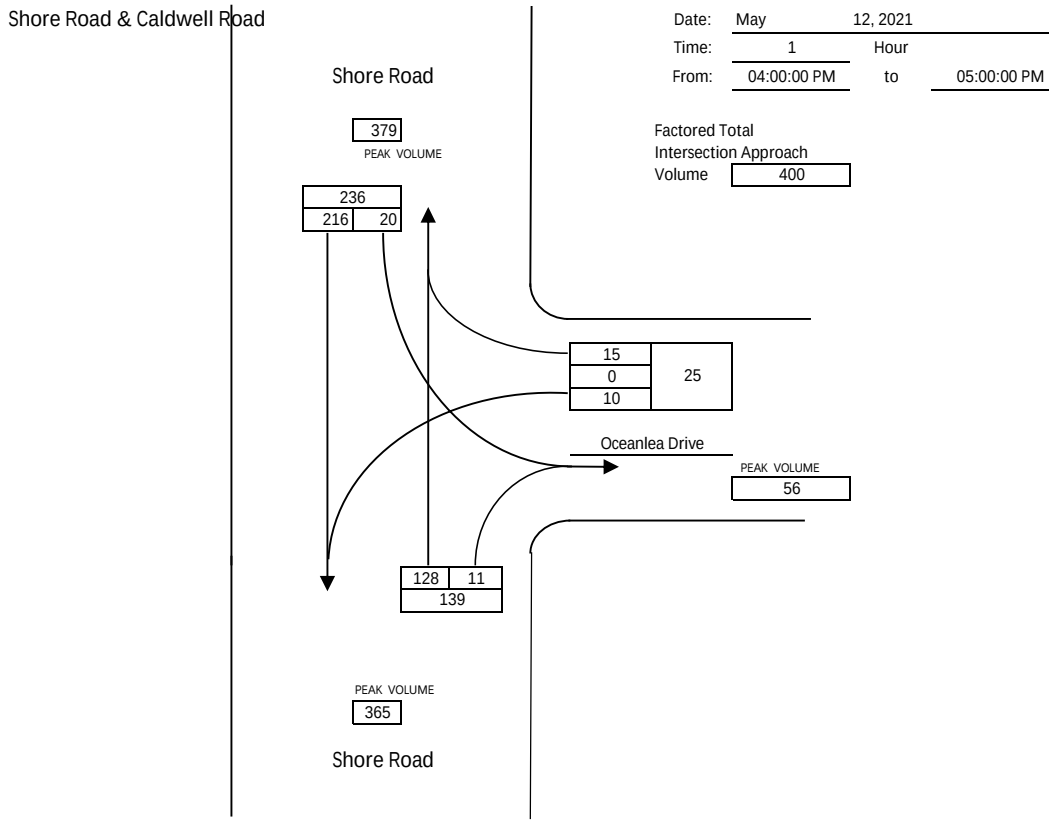
Date: May 12, 2021 Data collected by: Miovision

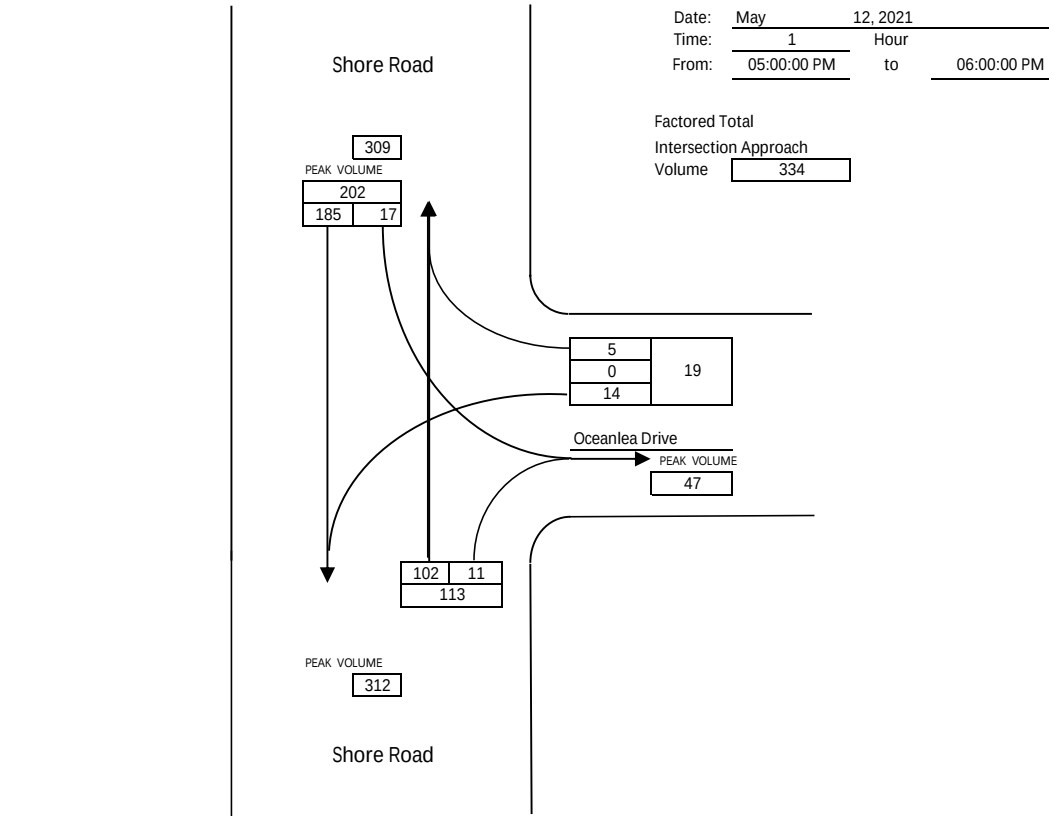
STREET:		Oceanlea Drive			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
04:00 PM	04:15 PM	0		5	3	61			29	1	99
04:15 PM	04:30 PM	9		4	6	48			42	4	113
04:30 PM	04:45 PM	0		2	3	52			27	3	87
04:45 PM	05:00 PM	1		4	8	55			30	3	101
TOTAL		10		15	20	216	0	0	128	11	400
PEAK		25			236			139			
15 MIN PEAK		13			64			46			
PEAK HOUR FACTOR		1.92			3.69			3.02			
TWO WAY TOTALS		56			379			365			FACTOR
											1
											400

STREET:		Oceanlea Drive			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
05:00 PM	05:15 PM	3		1	4	45			22	2	77
05:15 PM	05:30 PM	5		1	3	61			16	5	91
05:30 PM	05:45 PM	3		1	5	43			40	1	93
05:45 PM	06:00 PM	3		2	5	36			24	3	73
TOTAL		14	0	5	17	185	0	0	102	11	334
PEAK		19			202			113			
15 MIN PEAK		6			64			41			
PEAK HOUR FACTOR		3.17			3.16			2.76			
TWO WAY TOTALS		47			309			312			FACTOR
											1
											334

Vehicular Graphic Summary Sheet

Intersection: Shore Road & Oceanlea Drive, Eastern Passage





Turning Movement Count

Intersection: Shore Road & Cow Bay Road, Eastern Passage

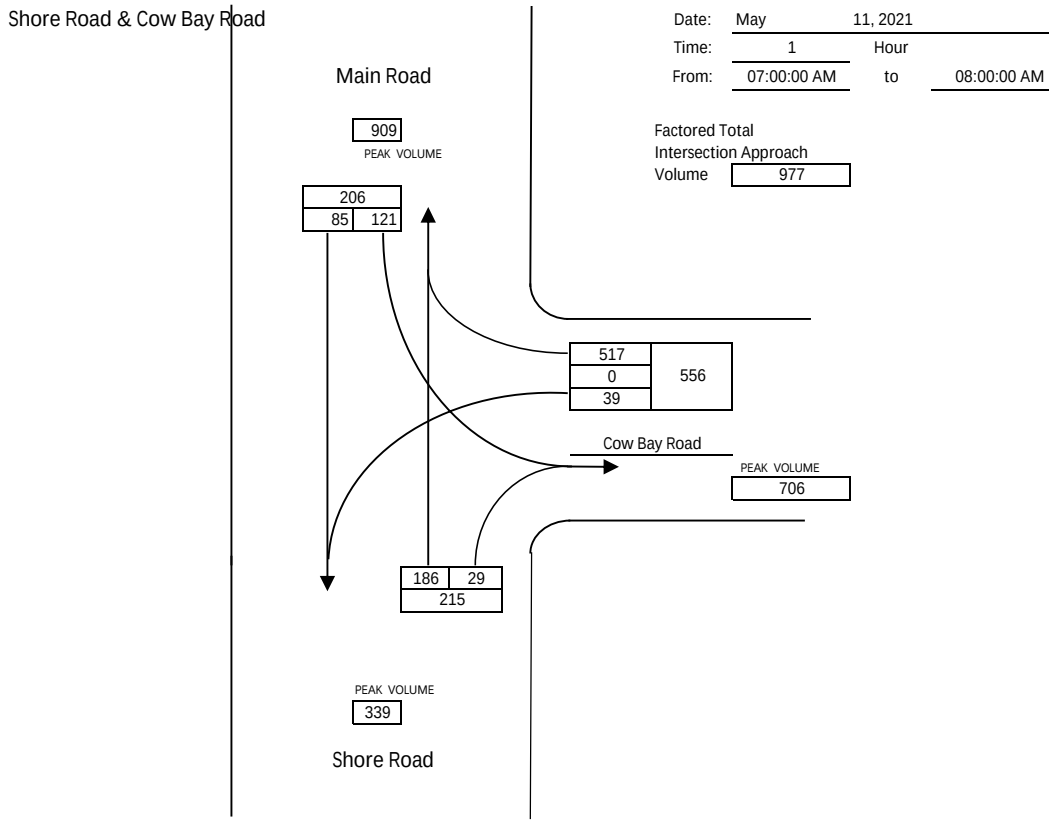
Date: May 11, 2021 Data collected by: Miovision

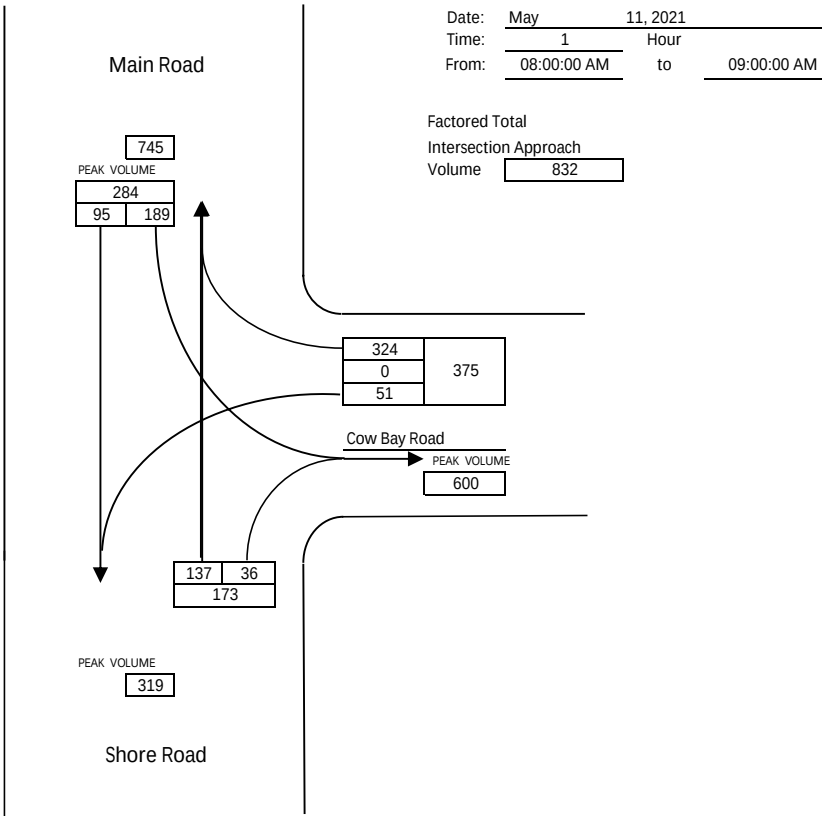
STREET:		Cow Bay Road			Main Road			Shore Road			
TIME:		From the East			From the North			From the South			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
07:00 AM	07:15 AM	4		137	21	12			50	4	228
07:15 AM	07:30 AM	5		137	34	22			43	10	251
07:30 AM	07:45 AM	12		141	38	17			56	7	271
07:45 AM	08:00 AM	18		102	28	34			37	8	227
TOTAL		39	0	517	121	85	0	0	186	29	977
PEAK			556			206			215		
15 MIN PEAK			153			62			63		
PEAK HOUR FACTOR			3.63			3.32			3.41		
TWO WAY TOTALS			706			909			339		FACTOR
											1
											977

		Cow Bay Road			Main Road			Shore Road			
TIME:		From the East			From the North			From the South			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
08:00 AM	08:15 AM	13		97	47	23			39	4	223
08:15 AM	08:30 AM	12		73	43	25			27	12	192
08:30 AM	08:45 AM	15		78	49	16			41	6	205
08:45 AM	09:00 AM	11		76	50	31			30	14	212
TOTAL		51	0	324	189	95	0	0	137	36	832
PEAK			375			284			173		
15 MIN PEAK			110			81			47		
PEAK HOUR FACTOR			3.41			3.51			3.68		
TWO WAY TOTALS			600			745			319		FACTOR
											1
											832

Vehicular Graphic Summary Sheet

Intersection: Shore Road & Cow Bay Road, Eastern Passage





Turning Movement Count

Intersection: Shore Road & Cow Bay Road, Eastern Passage

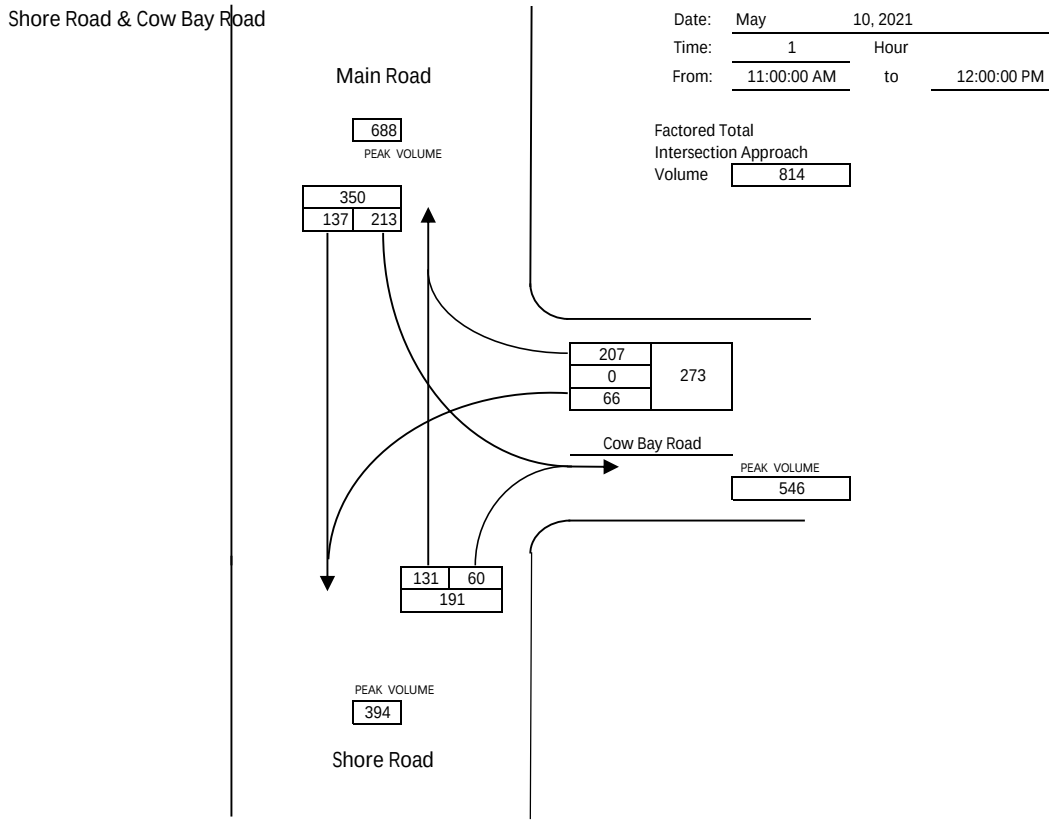
Date: May 10, 2021 Data collected by: Miovision

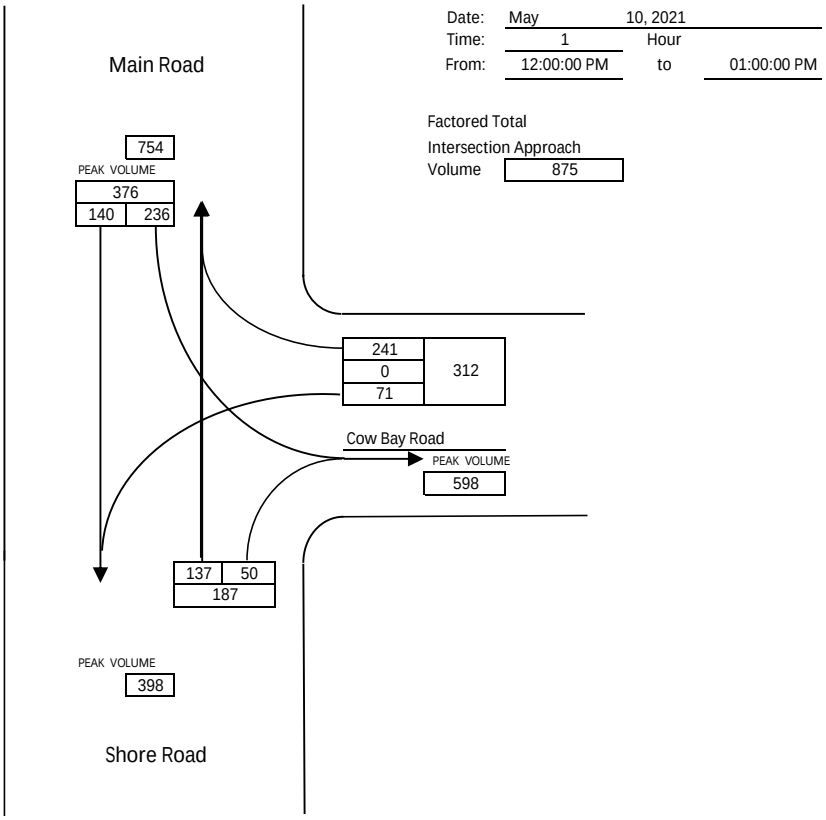
STREET:		Cow Bay Road			Main Road			Shore Road			
TIME:		From the East			From the North			From the South			TOTAL
15 MIN INTERVALS		L	T	R	L	T	R	L	T	R	
11:00 AM	11:15 AM	12		47	58	32			20	13	182
11:15 AM	11:30 AM	18		54	34	37			39	15	197
11:30 AM	11:45 AM	23		46	61	37			38	12	217
11:45 AM	12:00 PM	13		60	60	31			34	20	218
TOTAL		66		207	213	137	0	0	131	60	814
PEAK		273			350			191			
15 MIN PEAK		73			98			54			
PEAK HOUR FACTOR		3.74			3.57			3.54			
TWO WAY TOTALS		546			688			394			FACTOR
											1
											814

STREET:		Cow Bay Road			Main Road			Shore Road			
TIME:		From the East			From the North			From the South			TOTAL
15 MIN INTERVALS		L	T	R	L	T	R	L	T	R	
12:00 PM	12:15 PM	21		55	65	36			37	11	225
12:15 PM	12:30 PM	17		55	55	44			33	10	214
12:30 PM	12:45 PM	17		69	65	30			34	18	233
12:45 PM	01:00 PM	16		62	51	30			33	11	203
TOTAL		71	0	241	236	140	0	0	137	50	875
PEAK		312			376			187			
15 MIN PEAK		86			101			52			
PEAK HOUR FACTOR		3.63			3.72			3.6			
TWO WAY TOTALS		598			754			398			FACTOR
											1
											875

Vehicular Graphic Summary Sheet

Intersection: Shore Road & Cow Bay Road, Eastern Passage





Turning Movement Count

Intersection: Shore Road & Cow Bay Road, Eastern Passage

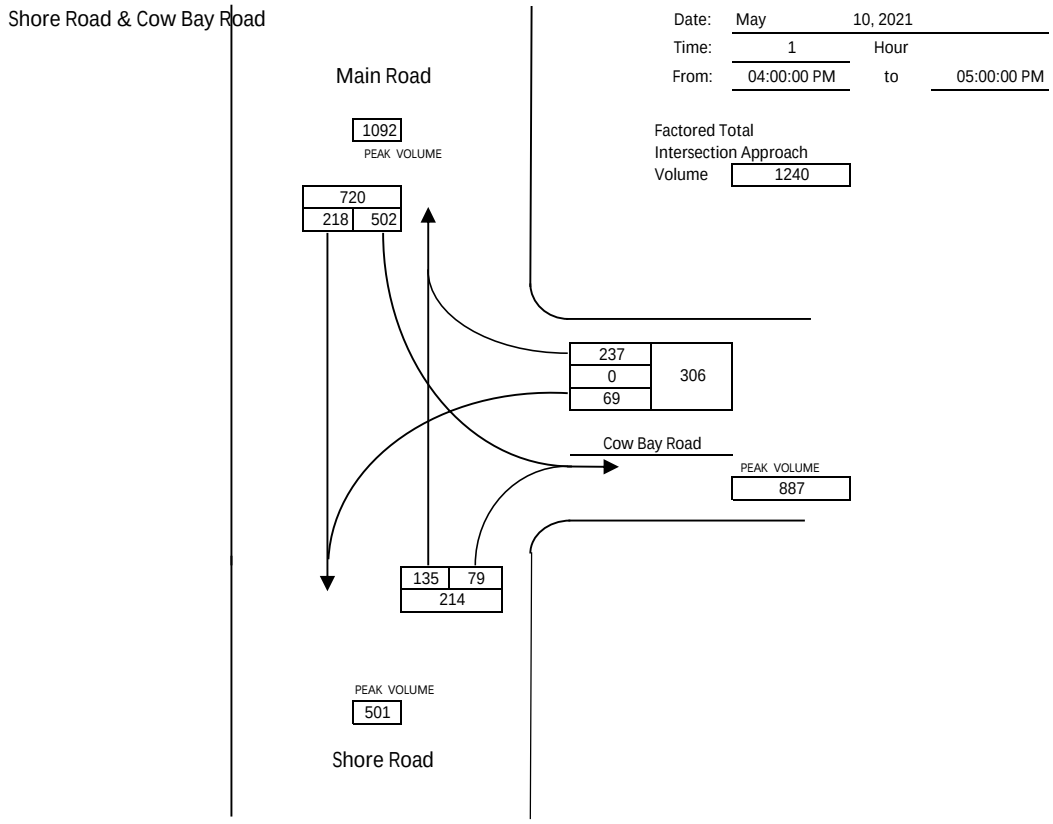
Date: May 10, 2021 Data collected by: Miovision

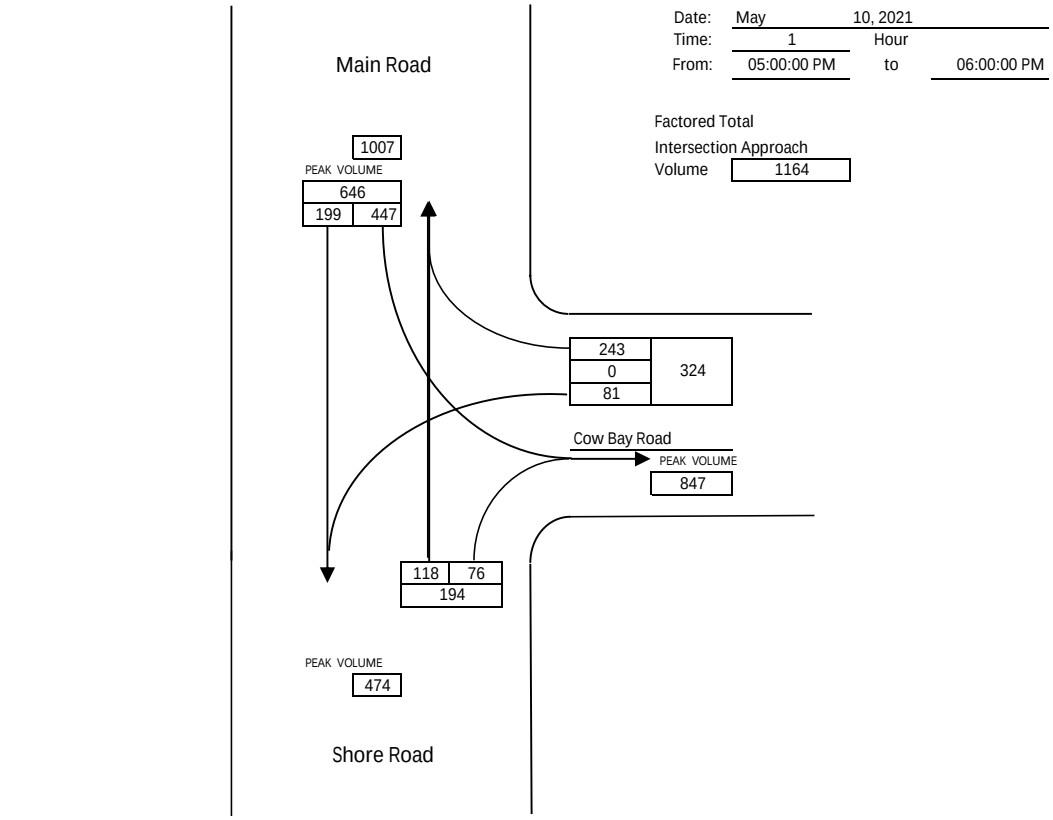
STREET:		Cow Bay Road			Main Road			Shore Road			
TIME:		From the East			From the North			From the South			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
04:00 PM	04:15 PM	23		58	119	60			36	29	325
04:15 PM	04:30 PM	13		51	112	58			41	18	293
04:30 PM	04:45 PM	20		66	126	46			30	19	307
04:45 PM	05:00 PM	13		62	145	54			28	13	315
TOTAL		69		237	502	218	0	0	135	79	1240
PEAK		306			720			214			
15 MIN PEAK		86			199			65			
PEAK HOUR FACTOR		3.56			3.62			3.29			
TWO WAY TOTALS		887			1092			501			FACTOR
											1
											1240

STREET:		Caldwell Road			Main Road			Shore Road			
TIME:		From the East			From the North			From the South			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
05:00 PM	05:15 PM	16		61	111	54			31	17	290
05:15 PM	05:30 PM	20		55	135	58			28	20	316
05:30 PM	05:45 PM	21		68	113	44			26	19	291
05:45 PM	06:00 PM	24		59	88	43			33	20	267
TOTAL		81	0	243	447	199	0	0	118	76	1164
PEAK		324			646			194			
15 MIN PEAK		89			193			53			
PEAK HOUR FACTOR		3.64			3.35			3.66			
TWO WAY TOTALS		847			1007			474			FACTOR
											1
											1164

Vehicular Graphic Summary Sheet

Intersection: Shore Road & Cow Bay Road, Eastern Passage





Turning Movement Count

Intersection: Shore Road & Caldwell Road, Eastern Passage

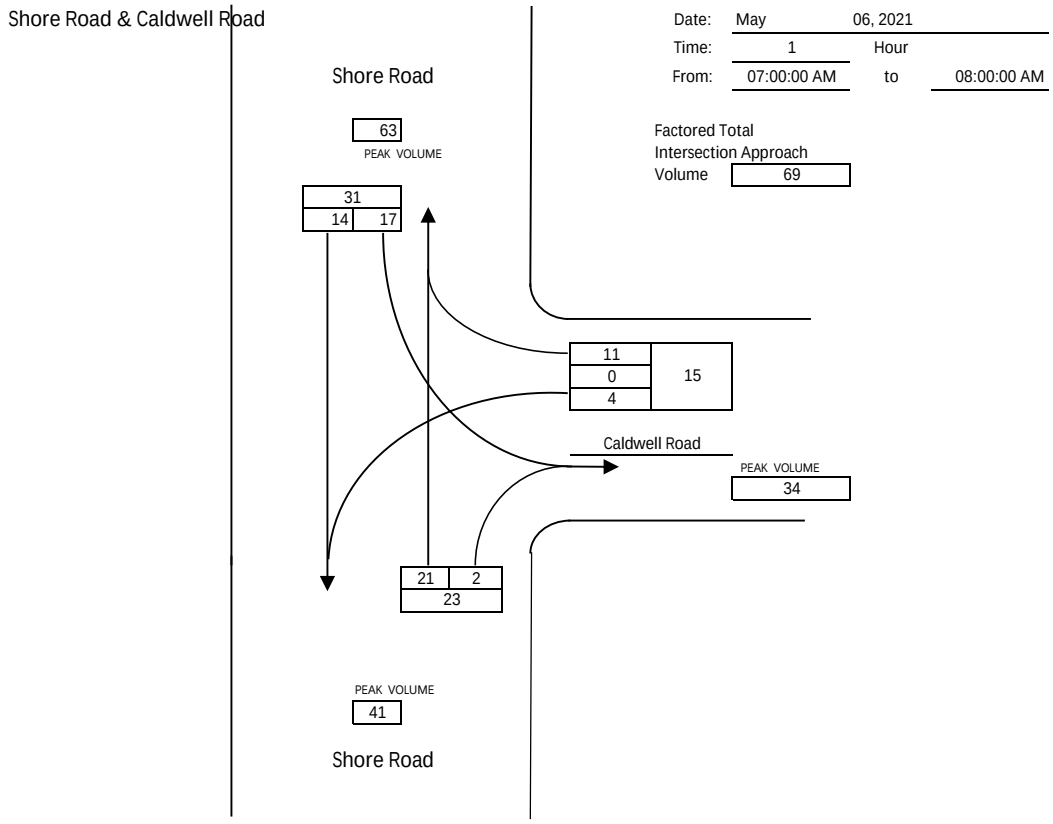
Date: May 06, 2021 Data collected by: Miovision

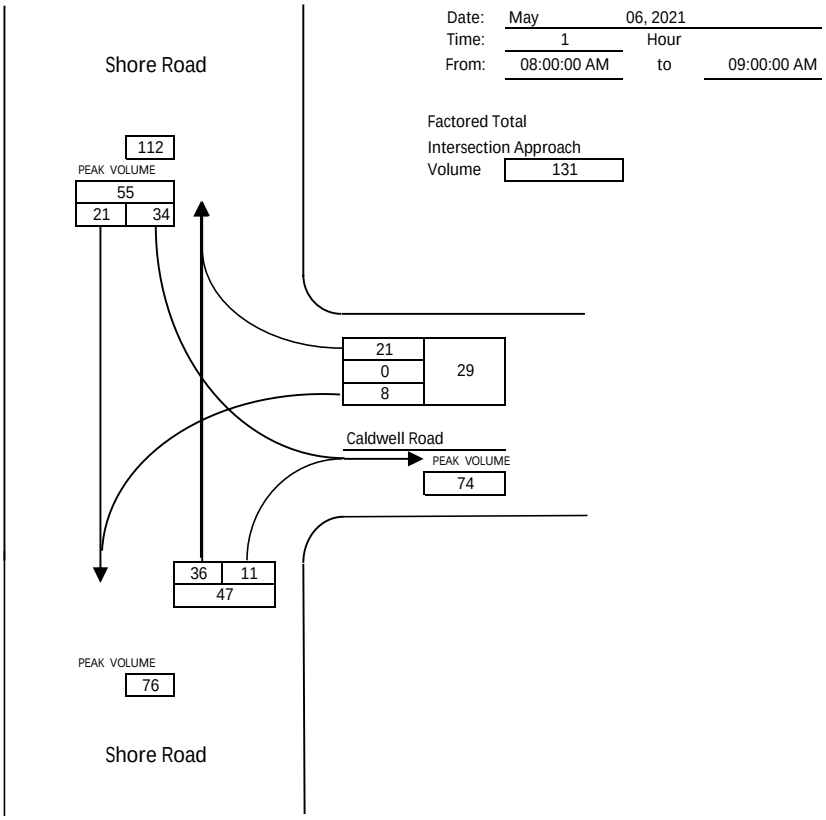
STREET:		Caldwell Road			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
07:00 AM	07:15 AM	3		2	1	1			1	0	8
07:15 AM	07:30 AM	1		3	3	2			9	0	18
07:30 AM	07:45 AM	0		4	7	3			4	1	19
07:45 AM	08:00 AM	0		2	6	8			7	1	24
TOTAL		4	0	11	17	14	0	0	21	2	69
PEAK		15			31			23			
15 MIN PEAK		5			14			9			
PEAK HOUR FACTOR		3			2.21			2.56			
TWO WAY TOTALS		34			63			41			FACTOR
											1
											69

		Caldwell Road			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
08:00 AM	08:15 AM	3		3	1	5			9	1	22
08:15 AM	08:30 AM	1		4	8	4			8	0	25
08:30 AM	08:45 AM	0		7	15	5			11	7	45
08:45 AM	09:00 AM	4		7	10	7			8	3	39
TOTAL		8	0	21	34	21	0	0	36	11	131
PEAK		29			55			47			
15 MIN PEAK		11			20			18			
PEAK HOUR FACTOR		2.64			2.75			2.61			
TWO WAY TOTALS		74			112			76			FACTOR
											1
											131

Vehicular Graphic Summary Sheet

Intersection: Shore Road & Caldwell Road, Eastern Passage





Turning Movement Count

Intersection: Shore Road & Caldwell Road, Eastern Passage

Date: May 05, 2021 Data collected by: Miovision

STREET:		Caldwell Road			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
04:00 PM	04:15 PM	6		10	12	13			4	10	55
04:15 PM	04:30 PM	7		9	10	15			7	11	59
04:30 PM	04:45 PM	5		3	10	16			12	7	53
04:45 PM	05:00 PM	3		9	11	11			13	3	50
TOTAL		21		31	43	55	0	0	36	31	217
PEAK		52			98			67			
15 MIN PEAK		16			26			19			
PEAK HOUR FACTOR		3.25			3.77			3.53			
TWO WAY TOTALS		126			165			143			FACTOR
											1
											217

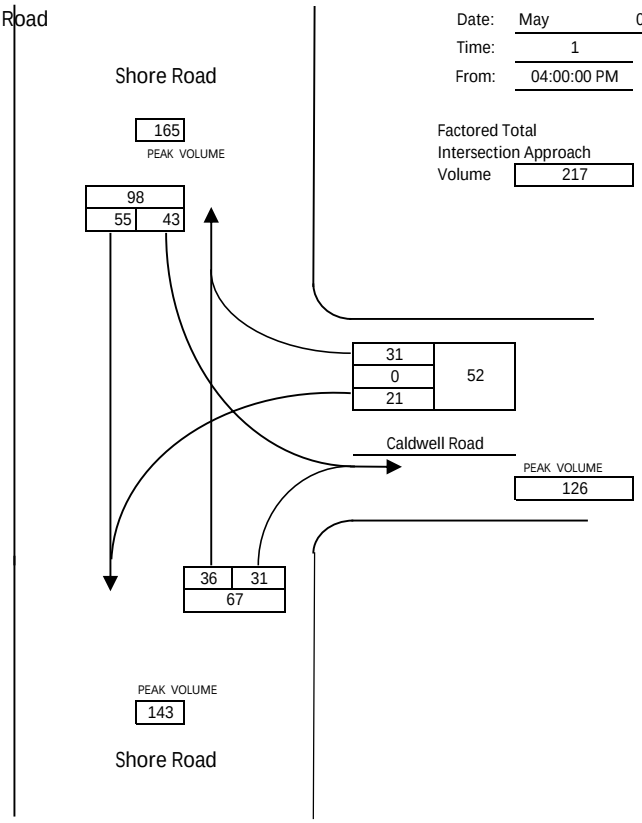
STREET:		Caldwell Road			Shore Road						
TIME:		From the North			From the West			From the East			TOTAL
15 MIN INTERVALS		L	UT	R	L	T	UT	UT	T	R	
05:00 PM	05:15 PM	3		10	8	13			17	4	55
05:15 PM	05:30 PM	5		4	16	11			6	2	44
05:30 PM	05:45 PM	4		10	8	12			15	2	51
05:45 PM	06:00 PM	3		15	11	11			5	3	48
TOTAL		15	0	39	43	47	0	0	43	11	198
PEAK		54			90			54			
15 MIN PEAK		18			27			21			
PEAK HOUR FACTOR		3			3.33			2.57			
TWO WAY TOTALS		108			172			116			FACTOR
											1
											198

Vehicular Graphic Summary Sheet

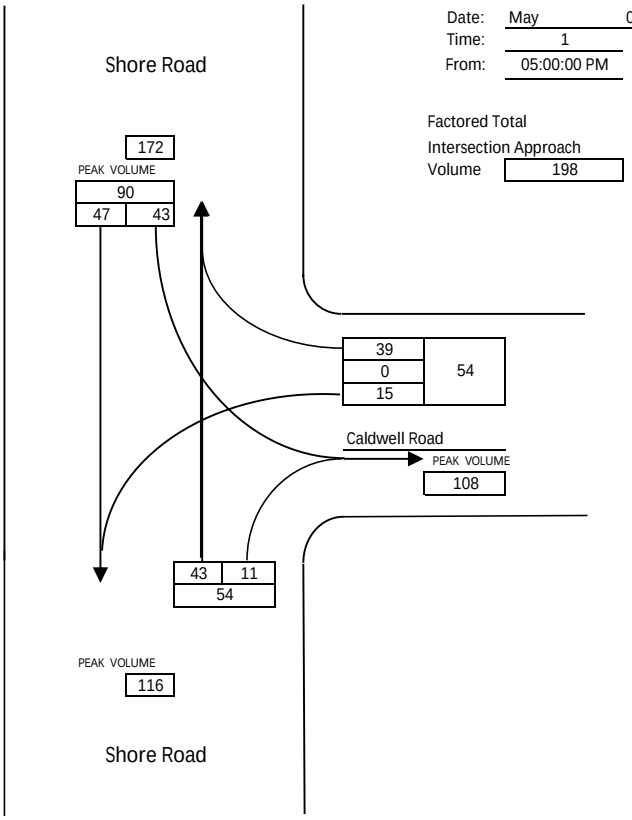
Intersection: Shore Road & Caldwell Road, Eastern Passage

Shore Road & Caldwell Road

Date: May 05, 2021
Time: 1 Hour
From: 04:00:00 PM to 05:00:00 PM



Date: May 05, 2021
Time: 1 Hour
From: 05:00:00 PM to 06:00:00 PM

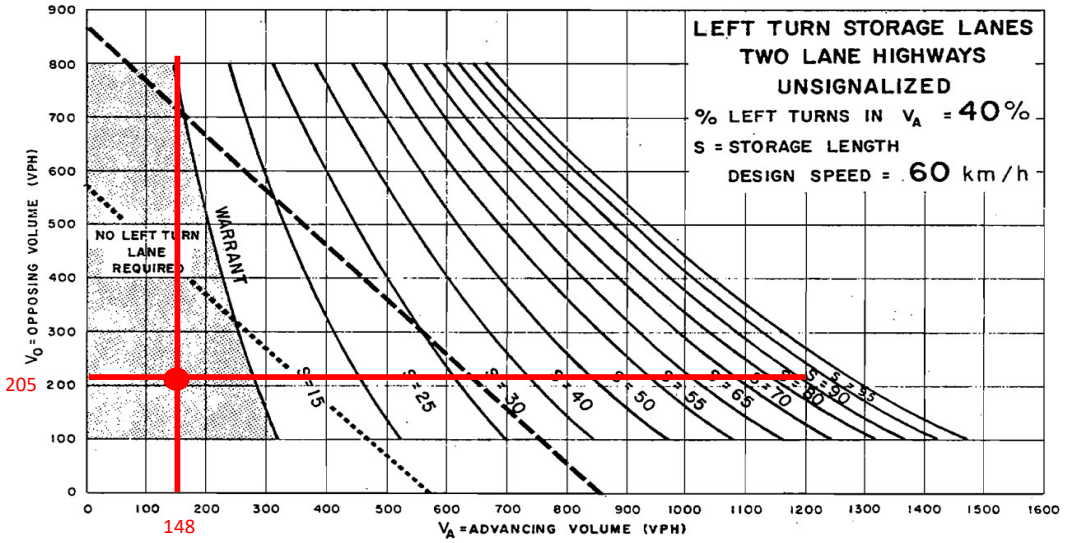


APPENDIX B – AUXILIARY LANE WARRANT ANALYSIS

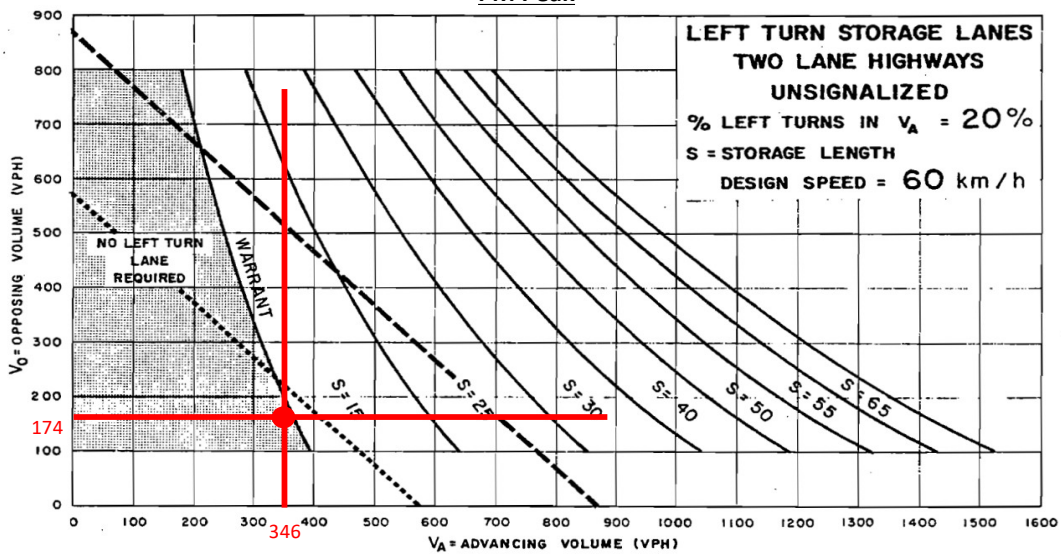
Left Turn Warrant Analysis - Blue Ocean

	LEFT TURN	
	AM	PM
V_A (%)	40.5%	20.2%
V_A (vph)	148	346
V_O (vph)	205	174
Left Turn	60	70

AM Peak



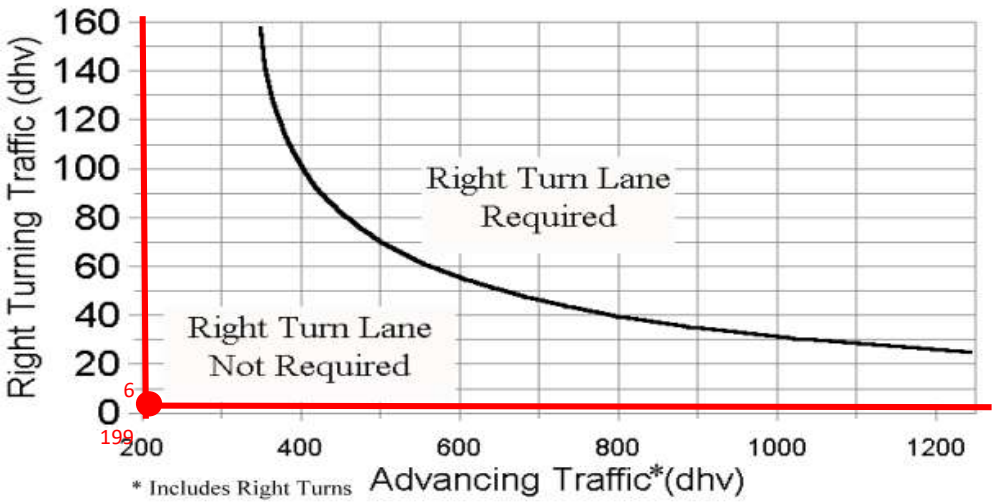
PM Peak



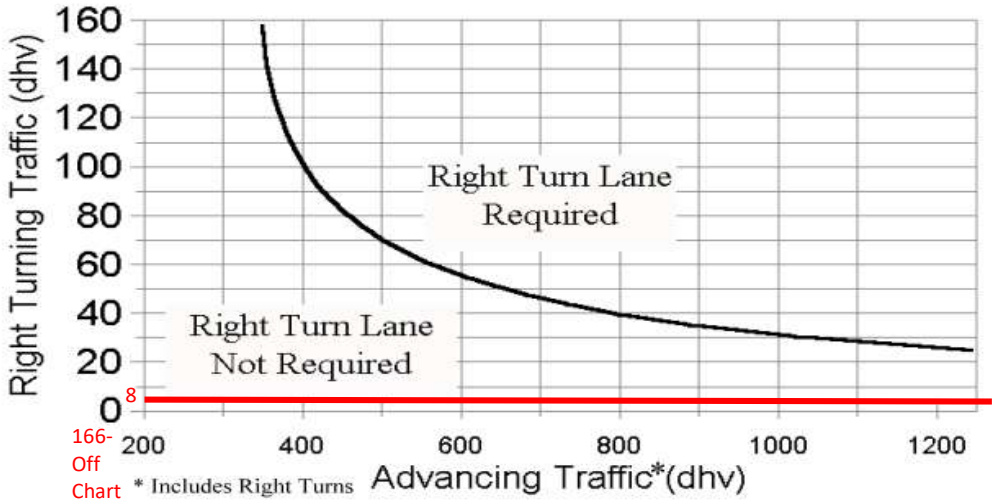
Right Turn Warrant Analysis - Blue Ocean

	Right Turn	
	AM	PM
V_A (vph)	199	166
Right Turn	6	8

AM Peak



PM Peak



APPENDIX C - SYNCHRO REPORTS

1: Main Road/Cow Bay Road & Shore Road

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	240	40	160	110	50	670
Future Volume (vph)	240	40	160	110	50	670
Satd. Flow (prot)	1789	1601	1780	0	1789	1883
Flt Permitted	0.950				0.483	
Satd. Flow (perm)	1789	1601	1780	0	910	1883
Satd. Flow (RTOR)		43	64			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	261	43	294	0	54	728
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	22.5	22.5	22.5		9.5	22.5
Total Split (s)	24.0	24.0	26.0		10.0	36.0
Total Split (%)	40.0%	40.0%	43.3%		16.7%	60.0%
Yellow Time (s)	3.5	3.5	3.5		4.0	3.5
All-Red Time (s)	1.0	1.0	1.0		0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.0	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	13.3	13.3	27.9		34.5	34.0
Actuated g/C Ratio	0.24	0.24	0.50		0.61	0.60
v/c Ratio	0.62	0.10	0.32		0.08	0.64
Control Delay	25.2	6.3	10.1		5.9	11.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	25.2	6.3	10.1		5.9	11.6
LOS	C	A	B		A	B
Approach Delay	22.6		10.1			11.2
Approach LOS	C		B			B
Queue Length 50th (m)	22.3	0.0	14.4		1.8	39.7
Queue Length 95th (m)	40.1	5.4	35.0		6.4	91.2
Internal Link Dist (m)	126.0		76.0			36.0
Turn Bay Length (m)	30.0				30.0	
Base Capacity (vph)	622	585	915		651	1136
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.42	0.07	0.32		0.08	0.64

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.3	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Main Road/Cow Bay Road & Shore Road

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	80	170	10	5	20
Future Vol, veh/h	20	80	170	10	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	87	185	11	5	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	196	0	-	0	322	191
Stage 1	-	-	-	-	191	-
Stage 2	-	-	-	-	131	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1377	-	-	-	672	851
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	895	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1377	-	-	-	661	851
Mov Cap-2 Maneuver	-	-	-	-	661	-
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	895	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1377	-	-	-	805
HCM Lane V/C Ratio	0.016	-	-	-	0.034
HCM Control Delay (s)	7.7	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	80	180	0	0	0
Future Vol, veh/h	0	80	180	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	87	196	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	196	0	-	0	283	196
Stage 1	-	-	-	-	196	-
Stage 2	-	-	-	-	87	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1377	-	-	-	707	845
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	936	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1377	-	-	-	707	845
Mov Cap-2 Maneuver	-	-	-	-	707	-
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	936	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1377	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	20	40	10	10	20
Future Vol, veh/h	35	20	40	10	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	22	43	11	11	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	54	0	-	0	147	49
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1551	-	-	-	845	1020
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	926	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1551	-	-	-	824	1020
Mov Cap-2 Maneuver	-	-	-	-	824	-
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	926	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1551	-	-	-	945
HCM Lane V/C Ratio	0.025	-	-	-	0.035
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

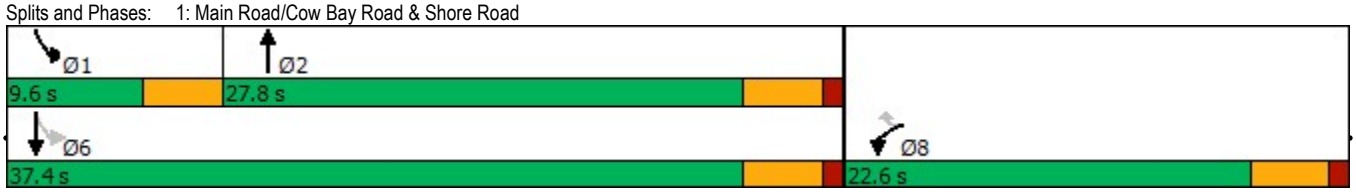
1: Main Road/Cow Bay Road & Shore Road

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	120	80	450	200	80	240
Future Volume (vph)	120	80	450	200	80	240
Satd. Flow (prot)	1789	1601	1806	0	1789	1883
Flt Permitted	0.950				0.229	
Satd. Flow (perm)	1789	1601	1806	0	431	1883
Satd. Flow (RTOR)		87	44			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	130	87	706	0	87	261
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	22.5	22.5	22.5		9.5	22.5
Total Split (s)	22.6	22.6	27.8		9.6	37.4
Total Split (%)	37.7%	37.7%	46.3%		16.0%	62.3%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	9.0	9.0	31.7		37.6	37.5
Actuated g/C Ratio	0.17	0.17	0.60		0.72	0.71
v/c Ratio	0.42	0.25	0.64		0.19	0.19
Control Delay	23.1	7.1	15.2		4.5	4.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	23.1	7.1	15.2		4.5	4.4
LOS	C	A	B		A	A
Approach Delay	16.7		15.2			4.4
Approach LOS	B		B			A
Queue Length 50th (m)	10.6	0.0	48.5		2.1	7.6
Queue Length 95th (m)	22.5	8.4	#116.6		6.5	18.2
Internal Link Dist (m)	126.0		76.0			36.0
Turn Bay Length (m)	30.0				30.0	
Base Capacity (vph)	617	609	1107		466	1343
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.21	0.14	0.64		0.19	0.19

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.5	
Natural Cycle: 65	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: Main Road/Cow Bay Road & Shore Road



Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	240	140	10	10	15
Future Vol, veh/h	20	240	140	10	10	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	261	152	11	11	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	163	0	-	0	463	158
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	305	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1416	-	-	-	557	887
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1416	-	-	-	547	887
Mov Cap-2 Maneuver	-	-	-	-	547	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	748	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1416	-	-	-	710
HCM Lane V/C Ratio	0.015	-	-	-	0.038
HCM Control Delay (s)	7.6	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	250	150	0	0	0
Future Vol, veh/h	0	250	150	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	272	163	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	163	0	-	0	435	163
Stage 1	-	-	-	-	163	-
Stage 2	-	-	-	-	272	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1416	-	-	-	578	882
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1416	-	-	-	578	882
Mov Cap-2 Maneuver	-	-	-	-	578	-
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1416	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	50	50	10	15	40
Future Vol, veh/h	40	50	50	10	15	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	54	54	11	16	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	65	0	-	0	200	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	140	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1537	-	-	-	789	1005
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	887	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1537	-	-	-	766	1005
Mov Cap-2 Maneuver	-	-	-	-	766	-
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	887	-

Approach	EB	WB	SB
HCM Control Delay, s	3.3	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1537	-	-	-	926
HCM Lane V/C Ratio	0.028	-	-	-	0.065
HCM Control Delay (s)	7.4	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

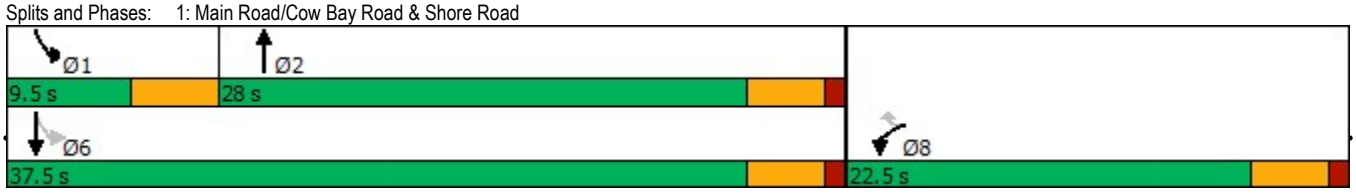
1: Main Road/Cow Bay Road & Shore Road

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	240	40	177	122	50	740
Future Volume (vph)	240	40	177	122	50	740
Satd. Flow (prot)	1789	1601	1780	0	1789	1883
Flt Permitted	0.950				0.463	
Satd. Flow (perm)	1789	1601	1780	0	872	1883
Satd. Flow (RTOR)		43	68			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	261	43	325	0	54	804
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	22.5	22.5	22.5		9.5	22.5
Total Split (s)	22.5	22.5	28.0		9.5	37.5
Total Split (%)	37.5%	37.5%	46.7%		15.8%	62.5%
Yellow Time (s)	3.5	3.5	3.5		4.0	3.5
All-Red Time (s)	1.0	1.0	1.0		0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.0	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	13.3	13.3	29.7		36.0	35.5
Actuated g/C Ratio	0.23	0.23	0.51		0.62	0.61
v/c Ratio	0.64	0.11	0.34		0.09	0.70
Control Delay	26.7	6.5	9.8		5.7	13.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	26.7	6.5	9.8		5.7	13.0
LOS	C	A	A		A	B
Approach Delay	23.8		9.8			12.6
Approach LOS	C		A			B
Queue Length 50th (m)	23.2	0.0	16.3		1.8	47.6
Queue Length 95th (m)	41.7	5.7	37.6		6.2	#108.4
Internal Link Dist (m)	126.0		76.0			76.0
Turn Bay Length (m)	30.0				30.0	
Base Capacity (vph)	559	530	947		629	1154
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.47	0.08	0.34		0.09	0.70

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.8	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: Main Road/Cow Bay Road & Shore Road



Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	88	188	10	5	20
Future Vol, veh/h	20	88	188	10	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	96	204	11	5	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	215	0	-	0	350	210
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	140	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1355	-	-	-	647	830
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	887	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1355	-	-	-	636	830
Mov Cap-2 Maneuver	-	-	-	-	636	-
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	887	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1355	-	-	-	782
HCM Lane V/C Ratio	0.016	-	-	-	0.035
HCM Control Delay (s)	7.7	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	88	199	0	0	0
Future Vol, veh/h	0	88	199	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	96	216	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	216	0	-	0	312	216
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	96	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1354	-	-	-	681	824
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	928	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1354	-	-	-	681	824
Mov Cap-2 Maneuver	-	-	-	-	681	-
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	928	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1354	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	22	44	10	10	20
Future Vol, veh/h	35	22	44	10	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	24	48	11	11	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	59	0	-	0	154	54
Stage 1	-	-	-	-	54	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1545	-	-	-	838	1013
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	924	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1545	-	-	-	817	1013
Mov Cap-2 Maneuver	-	-	-	-	817	-
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	924	-

Approach	EB	WB	SB
HCM Control Delay, s	4.5	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1545	-	-	-	938
HCM Lane V/C Ratio	0.025	-	-	-	0.035
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

1: Main Road/Cow Bay Road & Shore Road

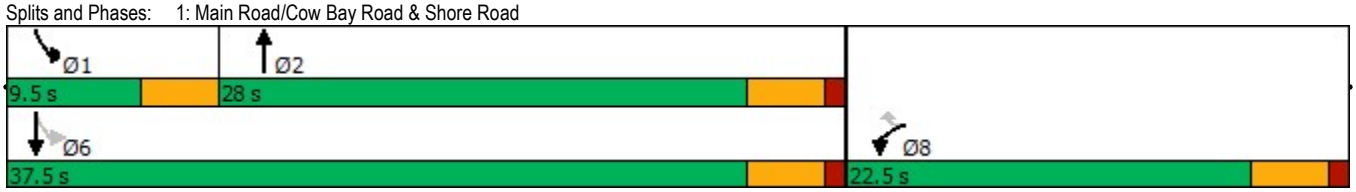
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	150	90	608	265	80	287
Future Volume (vph)	150	90	608	265	80	287
Satd. Flow (prot)	1789	1601	1806	0	1789	1883
Flt Permitted	0.950				0.117	
Satd. Flow (perm)	1789	1601	1806	0	220	1883
Satd. Flow (RTOR)		98	43			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	163	98	949	0	87	312
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	22.5	22.5	22.5		9.5	22.5
Total Split (s)	22.5	22.5	28.0		9.5	37.5
Total Split (%)	37.5%	37.5%	46.7%		15.8%	62.5%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		3.5	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	10.0	10.0	31.5		37.2	37.1
Actuated g/C Ratio	0.19	0.19	0.59		0.70	0.70
v/c Ratio	0.48	0.26	0.87		0.27	0.24
Control Delay	23.7	6.6	28.6		6.0	5.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	23.7	6.6	28.6		6.0	5.0
LOS	C	A	C		A	A
Approach Delay	17.3		28.6			5.2
Approach LOS	B		C			A
Queue Length 50th (m)	13.7	0.0	~105.3		2.3	10.2
Queue Length 95th (m)	27.1	8.7	#183.3		7.2	24.0
Internal Link Dist (m)	126.0		126.0			126.0
Turn Bay Length (m)	30.0				30.0	
Base Capacity (vph)	608	608	1090		332	1318
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.27	0.16	0.87		0.26	0.24

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

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

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

Splits and Phases: 1: Main Road/Cow Bay Road & Shore Road



Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	265	155	10	10	15
Future Vol, veh/h	20	265	155	10	10	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	288	168	11	11	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	179	0	-	0	506	174
Stage 1	-	-	-	-	174	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1397	-	-	-	526	869
Stage 1	-	-	-	-	856	-
Stage 2	-	-	-	-	727	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1397	-	-	-	516	869
Mov Cap-2 Maneuver	-	-	-	-	516	-
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	727	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1397	-	-	-	682
HCM Lane V/C Ratio	0.016	-	-	-	0.04
HCM Control Delay (s)	7.6	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	276	166	0	0	0
Future Vol, veh/h	0	276	166	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	300	180	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	180	0	-	0	480	180
Stage 1	-	-	-	-	180	-
Stage 2	-	-	-	-	300	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1396	-	-	-	545	863
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	752	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1396	-	-	-	545	863
Mov Cap-2 Maneuver	-	-	-	-	545	-
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	752	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1396	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	55	55	10	15	40
Future Vol, veh/h	40	55	55	10	15	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	60	60	11	16	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	71	0	-	0	212	66
Stage 1	-	-	-	-	66	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1529	-	-	-	776	998
Stage 1	-	-	-	-	957	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1529	-	-	-	753	998
Mov Cap-2 Maneuver	-	-	-	-	753	-
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	881	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1529	-	-	-	917
HCM Lane V/C Ratio	0.028	-	-	-	0.065
HCM Control Delay (s)	7.4	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

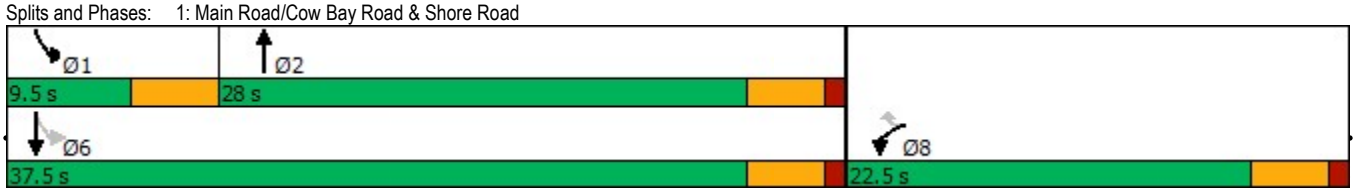
1: Main Road/Cow Bay Road & Shore Road

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	240	40	177	122	50	740
Future Volume (vph)	284	46	177	172	57	740
Satd. Flow (prot)	1789	1601	1757	0	1789	1883
Flt Permitted	0.950				0.411	
Satd. Flow (perm)	1789	1601	1757	0	774	1883
Satd. Flow (RTOR)		50	96			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	309	50	379	0	62	804
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	22.5	22.5	22.5		9.5	22.5
Total Split (s)	22.5	22.5	28.0		9.5	37.5
Total Split (%)	37.5%	37.5%	46.7%		15.8%	62.5%
Yellow Time (s)	3.5	3.5	3.5		4.0	3.5
All-Red Time (s)	1.0	1.0	1.0		0.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.0	4.5
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	14.4	14.4	28.8		34.9	34.4
Actuated g/C Ratio	0.25	0.25	0.50		0.60	0.60
v/c Ratio	0.69	0.11	0.41		0.11	0.72
Control Delay	28.1	6.2	10.3		6.2	14.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	28.1	6.2	10.3		6.2	14.2
LOS	C	A	B		A	B
Approach Delay	25.1		10.3			13.6
Approach LOS	C		B			B
Queue Length 50th (m)	28.4	0.0	19.4		2.3	52.4
Queue Length 95th (m)	49.9	6.1	42.7		6.9	#108.4
Internal Link Dist (m)	126.0		76.0			76.0
Turn Bay Length (m)	30.0				30.0	
Base Capacity (vph)	558	534	923		564	1120
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.55	0.09	0.41		0.11	0.72

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.8	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: Main Road/Cow Bay Road & Shore Road



Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	88	188	10	5	20
Future Vol, veh/h	20	145	238	13	8	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	158	259	14	9	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	273	0	-	0	468	266
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1290	-	-	-	553	773
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	832	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1290	-	-	-	542	773
Mov Cap-2 Maneuver	-	-	-	-	542	-
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	832	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1290	-	-	-	689
HCM Lane V/C Ratio	0.017	-	-	-	0.044
HCM Control Delay (s)	7.8	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	88	199	0	0	0
Future Vol, veh/h	60	88	199	6	6	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	96	216	7	7	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	223	0	-	0	446	220
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	226	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1346	-	-	-	570	820
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1346	-	-	-	541	820
Mov Cap-2 Maneuver	-	-	-	-	541	-
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	812	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1346	-	-	-	779
HCM Lane V/C Ratio	0.048	-	-	-	0.082
HCM Control Delay (s)	7.8	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	22	44	10	10	20
Future Vol, veh/h	38	25	47	10	10	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	27	51	11	11	25

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	166	57
Stage 1	-	-	-	-	57	-
Stage 2	-	-	-	-	109	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1541	-	-	-	824	1009
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	916	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1541	-	-	-	802	1009
Mov Cap-2 Maneuver	-	-	-	-	802	-
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	SB
HCM Control Delay, s	4.5	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1541	-	-	-	936
HCM Lane V/C Ratio	0.027	-	-	-	0.038
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

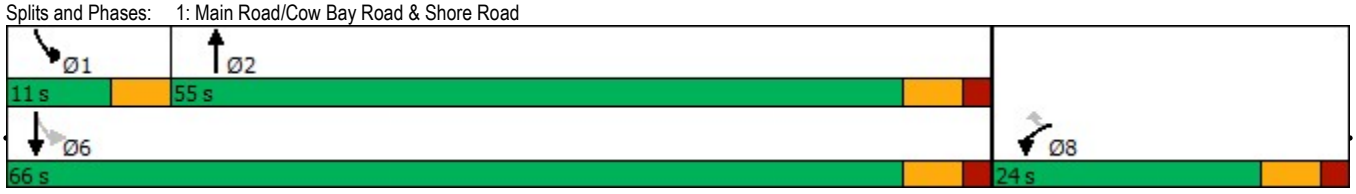
1: Main Road/Cow Bay Road & Shore Road

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	150	90	608	265	80	287
Future Volume (vph)	206	98	608	323	88	287
Satd. Flow (prot)	1789	1601	1795	0	1789	1883
Flt Permitted	0.950				0.071	
Satd. Flow (perm)	1789	1601	1795	0	134	1883
Satd. Flow (RTOR)		107	47			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	224	107	1012	0	96	312
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Detector Phase	8	8	2		1	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	24.0	24.0	24.0		11.0	24.0
Total Split (s)	24.0	24.0	55.0		11.0	66.0
Total Split (%)	26.7%	26.7%	61.1%		12.2%	73.3%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0		4.0	6.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	Max		None	Max
Act Effct Green (s)	15.1	15.1	52.4		63.0	61.0
Actuated g/C Ratio	0.17	0.17	0.59		0.72	0.69
v/c Ratio	0.73	0.29	0.93		0.44	0.24
Control Delay	48.8	8.7	34.4		13.8	6.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	48.8	8.7	34.4		13.8	6.0
LOS	D	A	C		B	A
Approach Delay	35.8		34.4			7.8
Approach LOS	D		C			A
Queue Length 50th (m)	35.7	0.0	152.8		4.3	17.4
Queue Length 95th (m)	59.0	12.8	#255.5		14.9	29.6
Internal Link Dist (m)	126.0		126.0			126.0
Turn Bay Length (m)	30.0				30.0	
Base Capacity (vph)	365	412	1085		227	1303
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.61	0.26	0.93		0.42	0.24

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 88.1	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 1: Main Road/Cow Bay Road & Shore Road



Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	265	155	10	10	15
Future Vol, veh/h	20	331	219	14	14	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	360	238	15	15	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	253	0	-	0	650	246
Stage 1	-	-	-	-	246	-
Stage 2	-	-	-	-	404	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1312	-	-	-	434	793
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	674	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1312	-	-	-	425	793
Mov Cap-2 Maneuver	-	-	-	-	425	-
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1312	-	-	-	559
HCM Lane V/C Ratio	0.017	-	-	-	0.056
HCM Control Delay (s)	7.8	0	-	-	11.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	276	166	0	0	0
Future Vol, veh/h	70	276	166	8	8	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	300	180	9	9	74

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	189	0	-	0	637	185
Stage 1	-	-	-	-	185	-
Stage 2	-	-	-	-	452	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1385	-	-	-	441	857
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	641	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1385	-	-	-	412	857
Mov Cap-2 Maneuver	-	-	-	-	412	-
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1385	-	-	-	770
HCM Lane V/C Ratio	0.055	-	-	-	0.107
HCM Control Delay (s)	7.8	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	55	55	10	15	40
Future Vol, veh/h	44	59	59	10	15	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	64	64	11	16	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	75	0	-	0	230	70
Stage 1	-	-	-	-	70	-
Stage 2	-	-	-	-	160	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1524	-	-	-	758	993
Stage 1	-	-	-	-	953	-
Stage 2	-	-	-	-	869	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1524	-	-	-	733	993
Mov Cap-2 Maneuver	-	-	-	-	733	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	869	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1524	-	-	-	911
HCM Lane V/C Ratio	0.031	-	-	-	0.07
HCM Control Delay (s)	7.4	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2