PROPOSED APARTMENT DEVELOPMENT
WILLIAM STREET, PORT STANLEY

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WILLIAM STREET, PORT STANLEY

1. INTRODUCTION AND BACKGROUND

Prespa Homes has proposed the development of a 52 unit apartment building west of William Street and south of Erie Street in Port Stanley. The location of the site is shown in **Figure 1**.

William Street is the primary access to Port Stanley's main beach. In the summer months recreational traffic is known to cause localized congestion. The purpose of this report is to assess the impact of the proposed development on summertime traffic operation on William Street.

2. EXISTING CONDITIONS

The existing lane configuration on William Street between George Street and Erie Street is shown in **Figure 2**. William Street is a two lane street with curb and gutter and sidewalks on both sides and a posted speed limit of 50km/h.

The intersection of William Street and George Street has a dedicated left turn lane and a shared through and right turn lane on the westbound (George Street) approach. All other approaches have single shared lanes. The northbound approach on William Street has a channelized right turn movement.

There are stop signs on all approaches except the westbound approach on George Street. The left turn is a free flow movement.

At the intersections of William Street with Smith Street and Erie Street all approaches are shared single lanes. There is a stop control on the minor street (Smith Street and Erie Street) approaches. Erie Street is a two lane street with curb and gutter and sidewalks and a posted speed limit of 50km/h.

For the purposes of this study, peak period traffic counts were made at the intersections of William Street with Erie Street and George Street on Wednesday, August 19 and Thursday, August 20, 2015. Peak hour turning movements derived from these counts are shown in **Figure 3**. Traffic count reports are contained in Appendix A.

It was noted that there was a significant discrepancy between northbound and southbound counted traffic volumes on William Street south of George Street and north of Erie Street in the afternoon peak hour. In order to resolve this discrepancy, traffic volumes on the major approaches at William Street and George Street were adjusted upwards to provide a match between the two intersections. The adjusted peak hour turning movements are shown in **Figure 4**.

3. PROPOSED DEVELOPMENT

The proposed development will include a 52 unit apartment building with approximately 1 855sf of retail space on the ground floor fronting William Street and three condominium townhouse units. A preliminary site plan is shown in **Figure 5**.

The only vehicular access to the development will be to and from Erie Street via First Street. There will be no direct vehicular access to William Street. First Street currently is a single lane street with an approximate pavement width of 3.3 metres. Photographs of First Street are contained in Appendix B.

It is understood that First Street will be reconstructed as part of this project to provide two traffic lanes 3.25 metres wide plus a 1.2 metre sidewalk. The maximum grade on the reconstructed First Street will be eight percent. The proposed design is acceptable for low volume urban streets.

Since the section of First Street providing access to the proposed development is relatively short (approximately 110 metres) there would be no need to post a lower speed limit. Normal driver behaviour will ensure that vehicles will travel at low speeds on First Street.

Peak hour vehicle trip generation was estimated based on rates contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual, Eighth Edition. A summary of the estimated trip generation is shown in **Table 1.**

It is anticipated that the retail component of the development will attract walk-in traffic from William Street. Vehicle trips generated by staff of the

retail establishments will generally arrive after the morning peak hour and leave after the afternoon peak hour. It is understood that parking for retail employees will be made available on site.

Vehicle trip generation rates for townhouses are lower than those for apartment units. To simplify the estimates, therefore, the three townhouse units were treated as apartment units and included in those estimates.

It should be noted that rates for conventional rental apartments were used in the estimates. Trip generation rates for apartment buildings occupied by seniors and retirees are significantly lower.

It was assumed that all peak hour trips generated by the proposed development would use Erie Street, William Street and George Street to access the downtown area of Port Stanley as well as Highway 4 to the north. No trips were assigned to the south since the development is within walking distance of the beach. **Figure 6** shows the assignment of peak hour site generated trips.

4. ANALYSIS

4.1 Projected Traffic

A five year planning horizon was assumed for this study. In the expectation that the development will be completed in 2016, adjusted peak hour turning volumes shown in **Figure 4** were projected to 2021 assuming an annual traffic growth rate of 1.5 percent.

Projected 2021 background peak hour traffic volumes are shown in **Figure 7.** Total projected peak hour traffic volumes are shown in **Figure 8**. The turning movements shown in **Figure 8** were obtained by adding site generated traffic from **Figure 6** to background traffic from **Figure 7**.

4.2 Level of Service Analysis

Each of the intersections of William Street with George Street and Erie Street was analyzed for volume to capacity (v/c) ratios, delays and queue lengths using the Synchro 6 analysis program. The results of the analysis are summarized in **Tables 2** and **3**. Analysis reports are contained in Appendix C.

The intersection of William Street and Smith Street was not analyzed. There would be no increase in turning movements to and from Smith Street. Any delays to traffic entering William Street from the side street would be minor.

Level of service is a measure of how well an intersection operates under prevailing traffic conditions. It is expressed on a scale of A to F where A is the highest level of service and F indicates unacceptable congestion and delay. Level of service is measured in terms of average delay to all vehicles passing through the intersection in the peak hour.

4.2.1 William Street and George Street (Table 2)

As noted above, traffic control at this intersection is somewhat unusual, with three of the four approaches controlled by stop signs and the other free flowing. The Synchro 6 program only considers all-way stops or two-way stops at four leg intersections.

The intersection was analyzed assuming no stop control on the eastbound and westbound approaches. It was reasoned that, while this assumption would likely under-estimate delays on the eastbound approach, it would over-estimate delays on the free flowing westbound approach, particularly for the left turn movement. Since this approach includes the heaviest approach volumes, the analysis would give a conservative estimate of intersection performance.

Results of the analyses for existing, projected background and projected total conditions are summarized in **Table 2.** The existing conditions assume the adjusted afternoon peak hour volumes from **Figure 4**.

Analysis of existing conditions indicates that the intersection operates at a good level of service. Overall intersection utilizations are approximately 20 percent in the morning peak hour and 40 percent in the afternoon peak hour. All major approaches would operate at level of service B or better.

Under projected background conditions, all approaches would continue to operate at a good level of service. Intersection utilization would increase by 1.2 percent in the morning peak hour and by 3.3 percent in the afternoon peak hour.

The addition of site generated traffic would increase intersection utilizations by two percent in the morning peak hour and by 2.3 percent in the afternoon peak hour. Approach delays would increase marginally with no changes in the levels of service.

The calculated 95th percentile queue length for the westbound left turn movement in the afternoon peak hour is 6.2 metres. Approximately 40 metres is available for storage in the left turn lane.

4.2.2 William Street and Erie Street (Table 3)

This intersection has single shared lanes on all four approaches and stop control on the Erie Street approaches. Results of the analyses for existing, projected background and projected total peak hour conditions are summarized in **Table 3**.

Analysis of existing conditions indicates that the intersection operates at a good level of service. Overall intersection utilizations are less than 20 percent in the morning peak hour and about 30 percent in the afternoon peak hour. All approaches would operate at level of service B or better.

Under projected background conditions, all approaches would continue to operate at a good level of service. Intersection utilization would increase by 0.6 percent in the morning peak hour and by 3.4 percent in the afternoon peak hour.

The addition of site generated traffic would increase intersection utilizations by 5.8 percent in the morning peak hour and by 1.9 percent in the afternoon peak hour. The larger increase in the morning peak hour is due to the increase in the volume turning left from Erie Street to William Street.

Approach delays would increase marginally with the eastbound approach delay on Erie Street increasing from 14.3 to 15.2 seconds and thus placing this movement at level of service C.

5. CONCLUSIONS

The proposed development will generate about 28 vehicle trips in the morning peak hour and 34 vehicle trips in the afternoon peak hour.

All site generated trips are likely to use Erie Street, William Street and George Street to access downtown Port Stanley and Highway 4 to the north.

Under projected 2021 summer weekday peak hour conditions, the intersections of William Street with George Street and Erie Street will continue to operate at a good level of service. No intersection improvements are required.

The reconstruction of First Street between Erie Street and the site will ensure safe vehicular access.

ITE Land Use			AM Peak Hour				PM Peak Hour			
			Ave. Rate	total	in	out	Ave. Rate	total	in	out
	Retail	1 855sf	-	0	0	0	-	0	0	0
220	Apartments	55du	0.51	28	6	22	0.62	34	22	12
230	Townhouses (incl. with apartments)		0.24	0	0	0	0.32	0	0	0
	Total			28	6	22		34	22	12

Table 1

Vehicle Trip Generation

Intersection	AM Peak Hour				PM Peak Hour			
	v/c	Del.	LofS	Q	v/c	Del.	LofS	Q
Existing, Aug. 20, 2015								
Eastbound LTR	0.00	0.0	-	0.0	0.00	0.0	-	0.0
Westbound L	0.03	7.5	A	0.9	0.16	7.9	A	4.7
Westbound TR	0.02	0.0	-	0.0	0.07	0.0	-	0.0
Northbound LTR	0.06	9.1	A	1.6	0.28	12.3	B	9.1
Southbound LTR	0.00	10.3	B	0.0	0.03	18.2	C	0.7
Intersection ICU			20.4%				39.6%	
LofS			A				A	
Background 2021								
Eastbound LTR	0.00	0.0	-	0.0	0.00	0.0	-	0.0
Westbound L	0.04	7.5	A	1.0	0.19	8.0	A	5.6
Westbound TR	0.02	0.0	-	0.0	0.08	0.0	-	0.0
Northbound LTR	0.07	9.2	A	1.9	0.34	13.8	B	12.1
Southbound LTR	0.00	10.6	B	0.0	0.03	21.2	C	0.8
Intersection ICU			21.6%				42.9%	
LofS			A				A	
Total 2021								
Eastbound LTR	0.00	0.0	-	0.0	0.00	0.0	-	0.0
Westbound L	0.04	7.5	A	1.1	0.21	8.1	A	6.2
Westbound TR	0.02	0.0	-	0.0	0.08	0.0	-	0.0
Northbound LTR	0.10	9.3	A	2.6	0.37	14.4	B	13.6
Southbound LTR	0.00	10.9	B	0.0	0.04	23.0	C	0.9
Intersection ICU			23.6%				45.2%	
LofS			A				A	

Note: Del. - ave. delay (secs.)

LofS - level of service

v/c - volume to capacity ratio

ICU - intersection capacity utilization

Q - maximum queue length (metres)
(95th percentile)

Table 2

Level of Service
William St. and George St.

Intersection	AM Peak Hour				PM Peak Hour			
	v/c	Del.	LofS	Q	v/c	Del.	LofS	Q
Existing, Aug. 19, 2015								
Eastbound LTR	0.01	9.6	A	0.2	0.02	12.9	B	0.5
Westbound LTR	0.01	8.9	A	0.2	0.04	12.5	B	0.9
Northbound LTR	0.00	0.0	-	0.0	0.00	0.2	A	0.1
Southbound LTR	0.00	0.0	-	0.0	0.00	0.2	A	0.1
Intersection ICU			18.1%				30.2%	
LofS			A				A	
Background 2021								
Eastbound LTR	0.01	9.8	A	0.4	0.03	14.3	B	0.7
Westbound LTR	0.01	9.0	A	0.2	0.06	13.5	B	1.5
Northbound LTR	0.00	0.0	-	0.0	0.00	0.2	A	0.1
Southbound LTR	0.00	0.0	-	0.0	0.00	0.2	A	0.1
Intersection ICU			18.7%				33.6%	
LofS			A				A	
Total 2021								
Eastbound LTR	0.04	9.9	A	1.1	0.07	15.2	C	1.7
Westbound LTR	0.01	9.0	A	0.2	0.06	13.7	B	1.6
Northbound LTR	0.00	0.0	-	0.0	0.00	0.2	A	0.1
Southbound LTR	0.00	0.0	-	0.0	0.00	0.2	A	0.1
Intersection ICU			24.5%				35.5%	
LofS			A				A	

Note: Del. - ave. delay (secs.)

LofS - level of service

v/c - volume to capacity ratio

ICU - intersection capacity utilization

Q - maximum queue length (metres)
(95th percentile)

Table 3

Level of Service
William St. and Erie St.

Figure 1

Area Plan

Figure 2

Lane Configuration

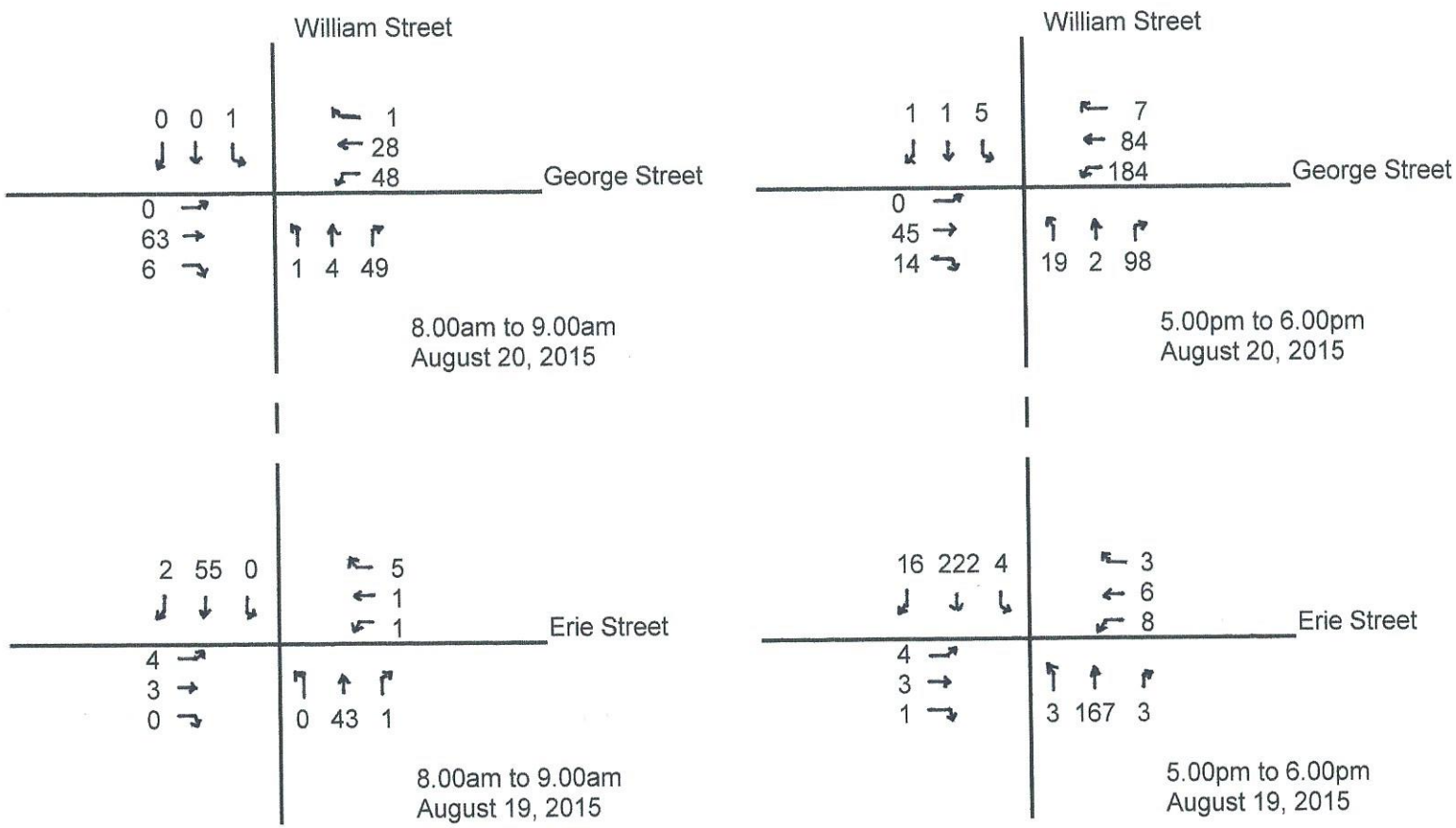
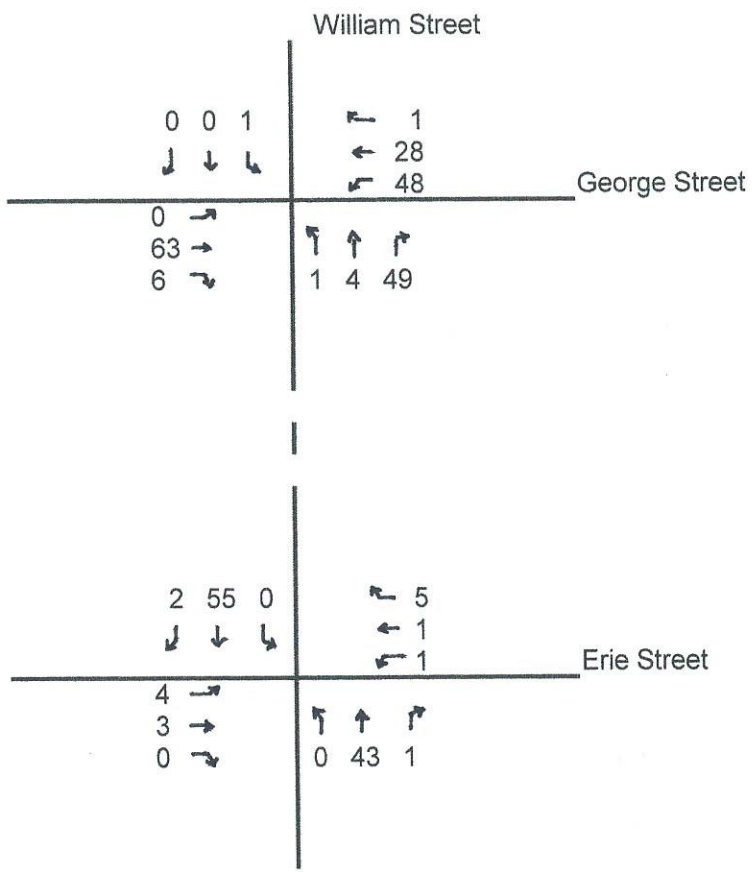
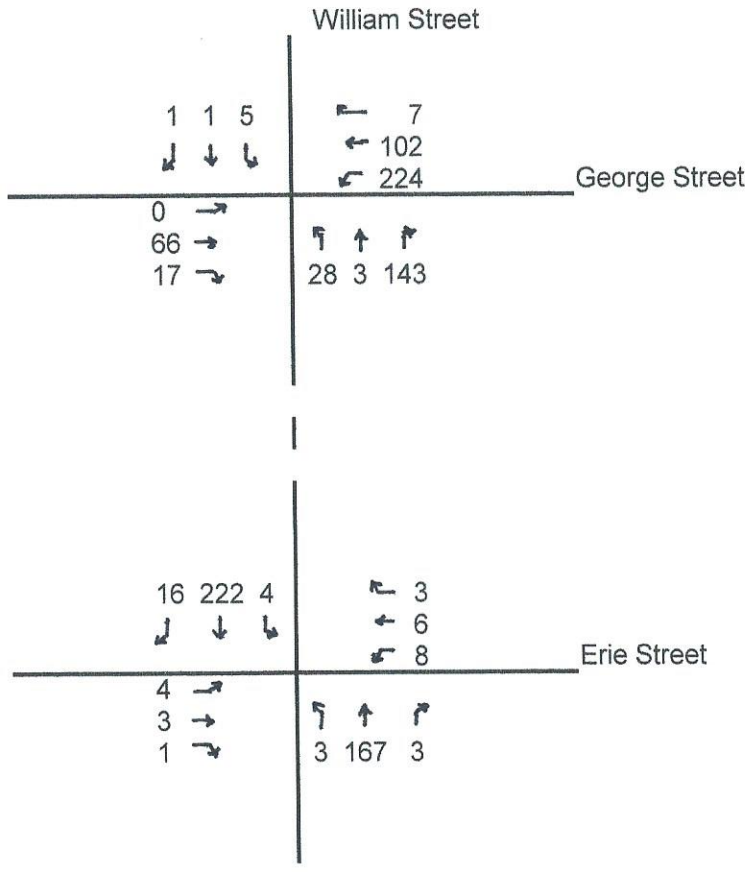


Figure 3

Existing Traffic



AM Peak Hour

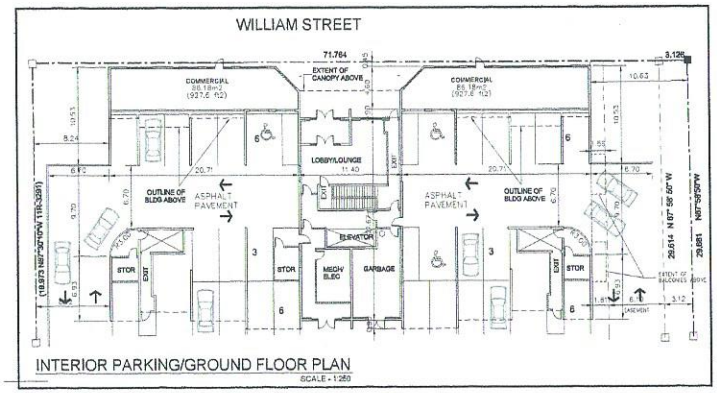


PM Peak Hour

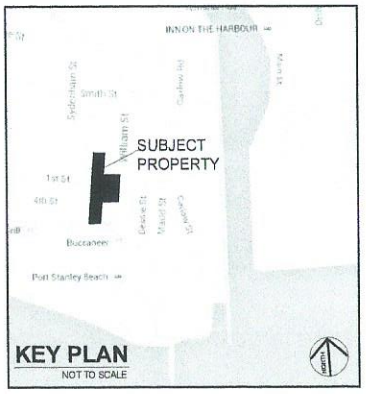
Figure 4

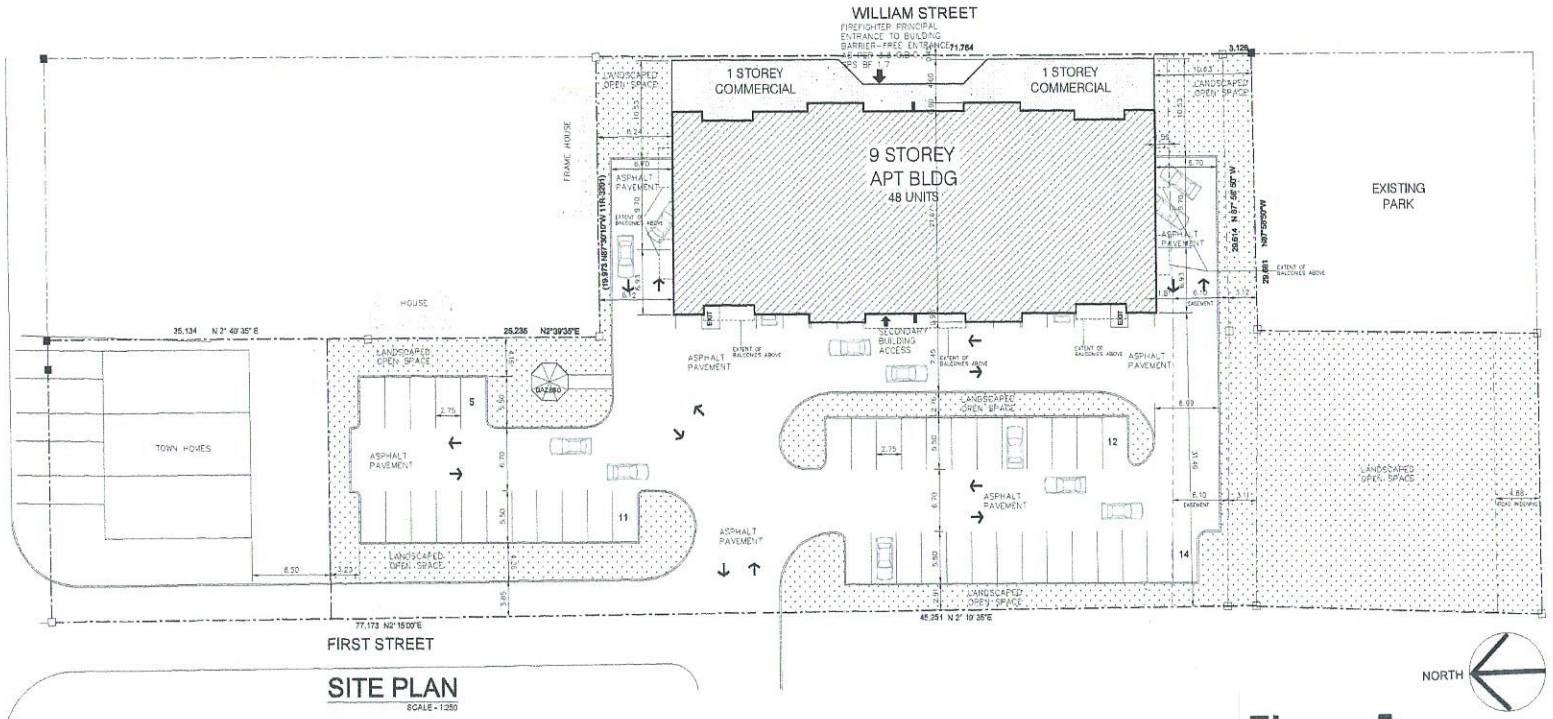
Existing Traffic (Adjusted)

SITE DATA	
STATISTICS	PROVIDED
LOT AREA:	6061.06 M2 (0.6 ha)
TOTAL NUMBER OF UNITS:	36 – 2 BEDROOM UNITS 12 – 3 BEDROOM UNITS 48 UNITS TOTAL (80/ha)
BUILDING AREA	1400.4m2 (23%)
LANDSCAPED AREA	2197.96 m2 (36.14%)
PAVED AREA	2482.7m2 (40.8%)
NORTH YARD SETBACK:	8.24m
SOUTH YARD SETBACK:	10.63m
EAST YARD SETBACK:	0.45m
WEST YARD SETBACK:	31.46m
BUILDING HEIGHT	9 STOREYS/27.6M
EXTERIOR PARKING	42 SPACES
INTERIOR PARKING	30 SPACES
TOTAL PARKING	72 SPACES (1.5/UNIT)



INTERIOR PARKING/GROUND FLOOR PLAN
SCALE - 1:250





SITE PLAN
SCALE - 1:250

Figure 5

Site Plan

REVISED NOV. 27, 2014

NOTES

CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THIS FIRM BEFORE PROCEEDING WITH THE WORK. ALL DRAWINGS REMAIN THE PROPERTY OF THIS FIRM.

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ADDED BALCONIES	1	NOV 27 2014	TD

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WILLIAM HAAS CONSULTANTS INC.
ARCHITECT / ENGINEER
LONDON, ONTARIO
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PROJECT:
PRESPA HOMES
9 STOREY APARTMENT BUILDING
WILLIAM STREET PORT STANLEY, ON

DRAWING TITLE:
SITE PLAN

SCALE: 1:250	DATE: JUNE 16, 2014
JOB NUMBER:	DRAWING No. SP1
DRAWN BY: TD	

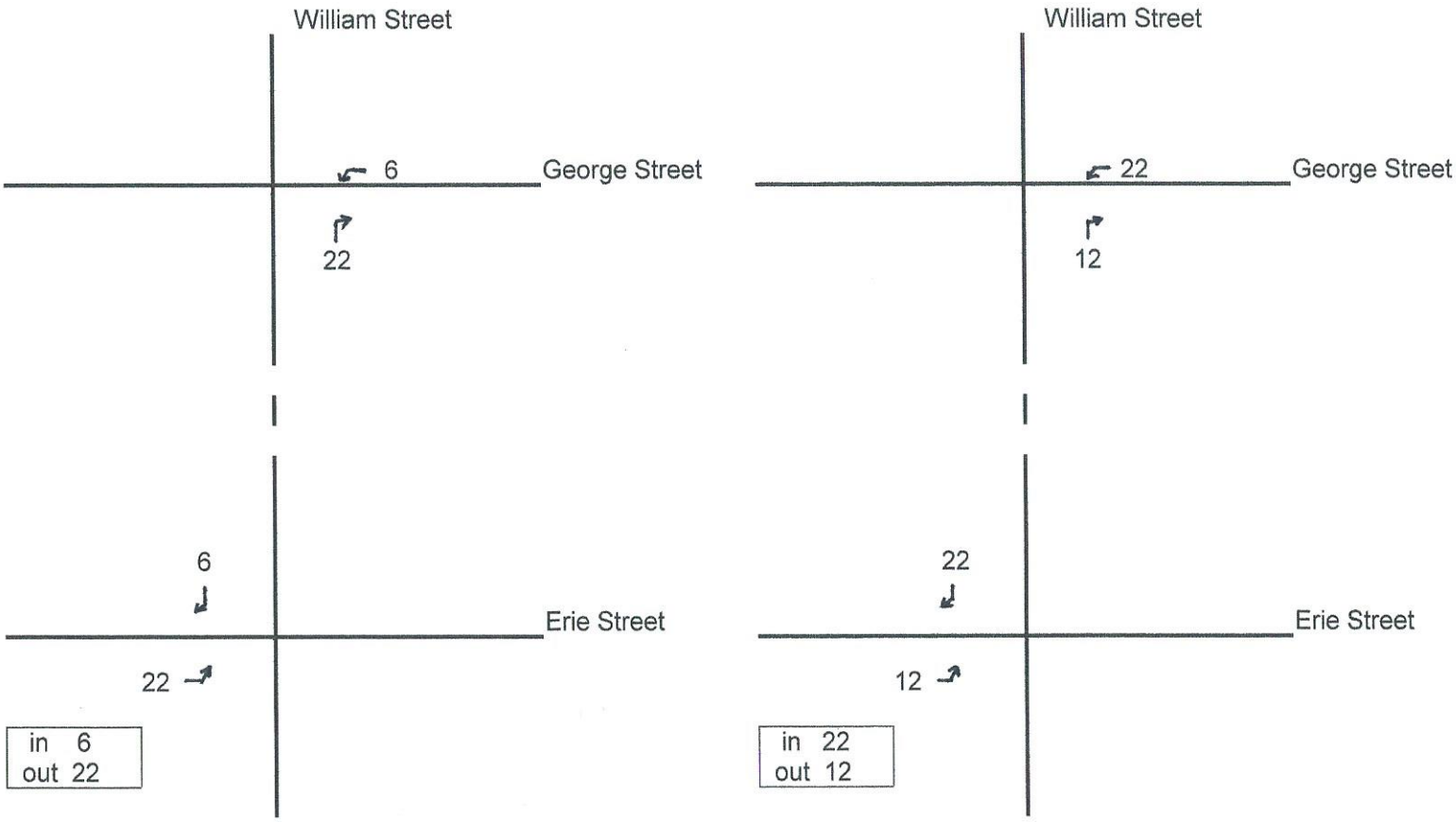


Figure 6

Site Generated Traffic

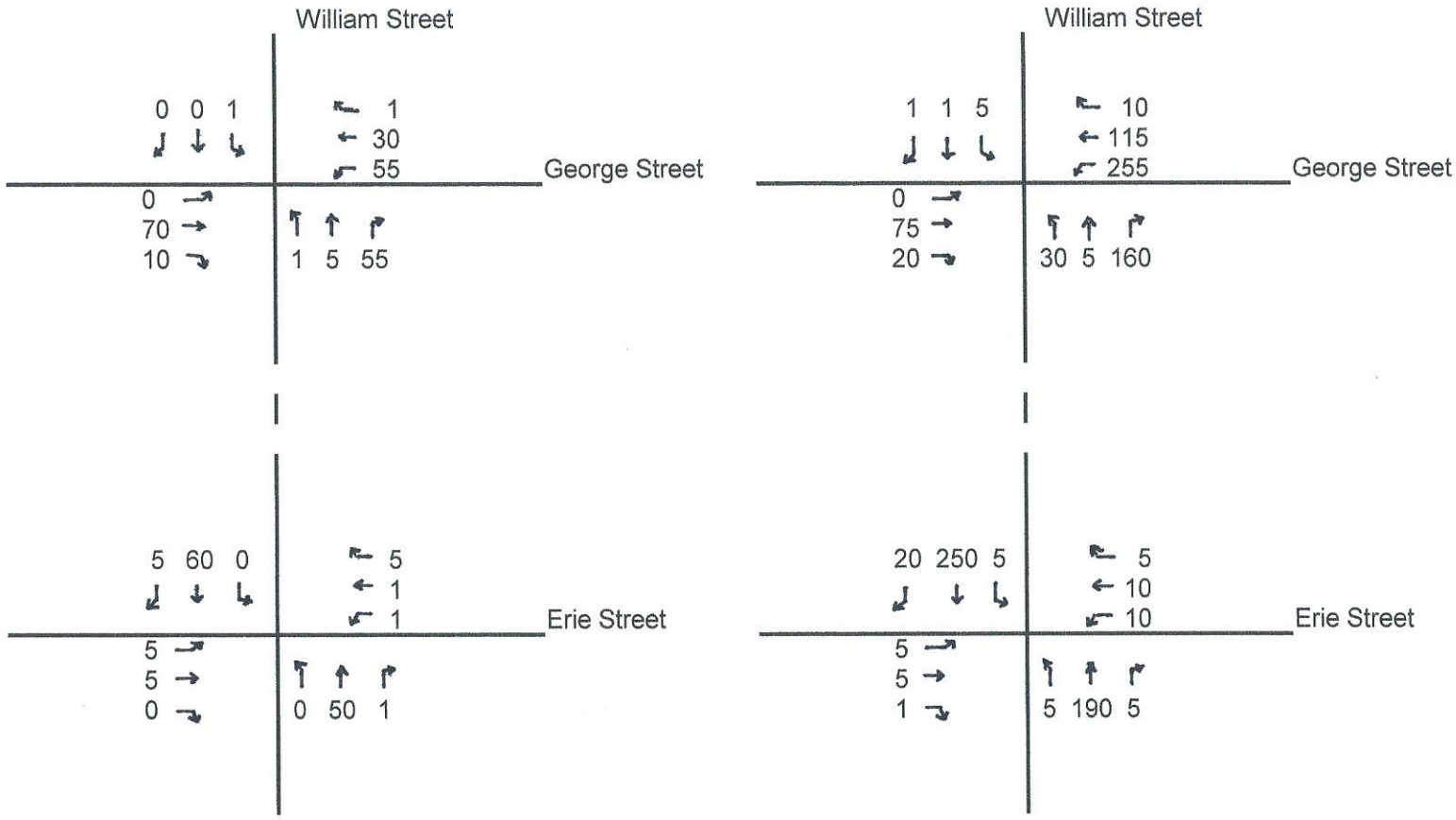


Figure 7

Background Traffic 2021

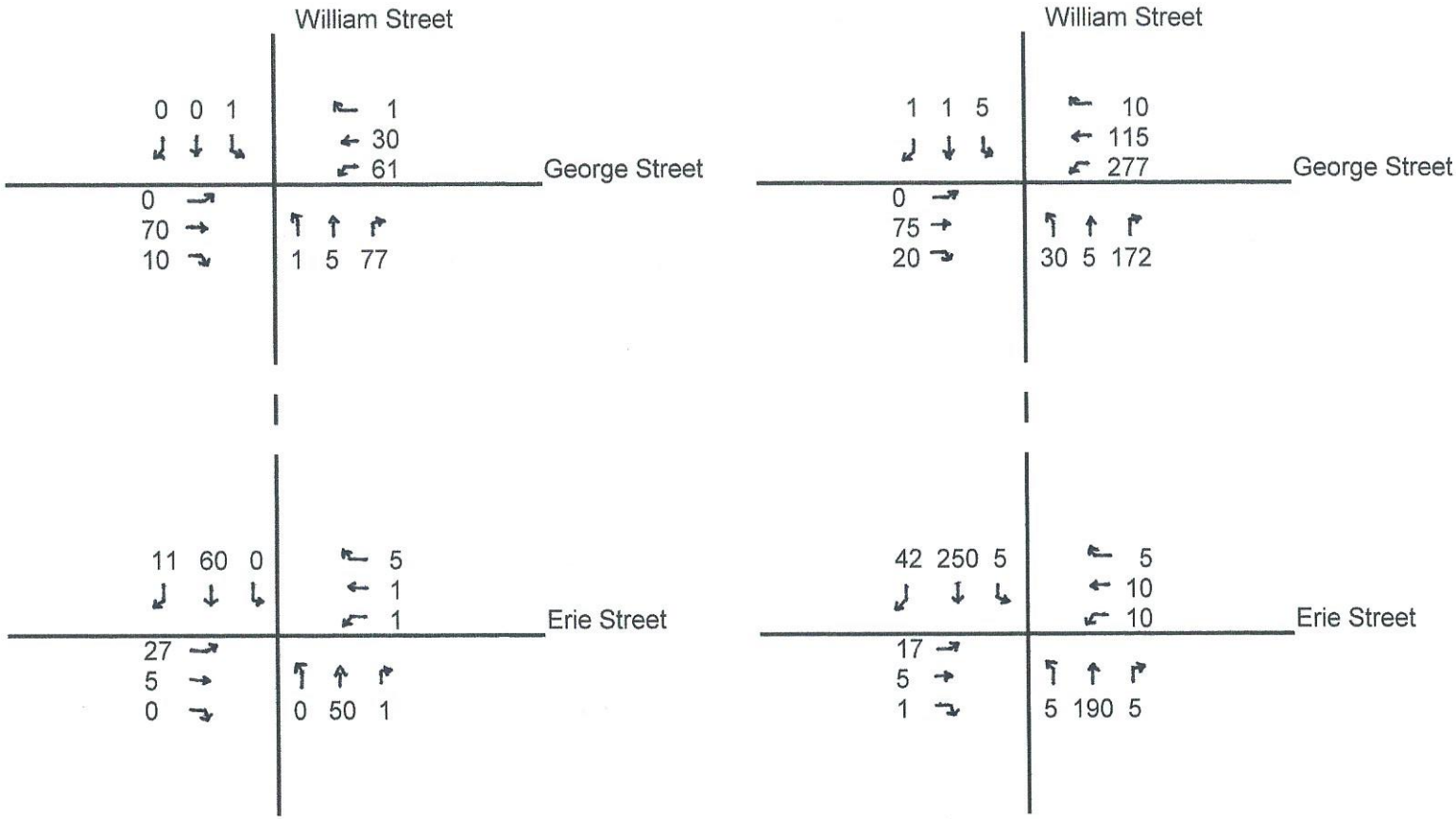


Figure 8

Total Traffic 2021

APPENDIX A

TRAFFIC COUNTS

William St @ George St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Port Stanley
Site #: 0000000003
Intersection: George St & William St
TFR File #: 3
Count date: 20-Aug-2015

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Hank

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

Major Road: George St runs W/E

North Leg Total: 6
North Entering: 1
North Peds: 2
Peds Cross: ⋈

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

Heavys	0
Trucks	1
Cars	4
Totals	5

East Leg Total: 190
East Entering: 77
East Peds: 0
Peds Cross: ⧖

Heavys	Trucks	Cars	Totals
0	0	29	29

William St

Cars	Trucks	Heavys	Totals
1	0	0	1
28	0	0	28
46	2	0	48
75	2	0	

George St

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
0	0	63	63
0	0	6	6
0	0	69	

George St

Cars	Trucks	Heavys	Totals
113	0	0	113

William St

Peds Cross: ⧖
West Peds: 1
West Entering: 69
West Leg Total: 98

Cars	52
Trucks	2
Heavys	0
Totals	54

Cars	1	3	49	53
Trucks	0	1	0	1
Heavys	0	0	0	0
Totals	1	4	49	

Peds Cross: ⋈
South Peds: 3
South Entering: 54
South Leg Total: 108

Comments

William St @ George St

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 13:00:00
To: 14:00:00

Municipality: Port Stanley
Site #: 0000000003
Intersection: George St & William St
TFR File #: 3
Count date: 20-Aug-2015

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Hank

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

Major Road: George St runs W/E

North Leg Total: 15
North Entering: 4
North Peds: 16
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	1	1	2	4
Totals	1	1	2	

Heavys	0
Trucks	0
Cars	11
Totals	11

East Leg Total: 446
East Entering: 242
East Peds: 0
Peds Cross: ⋈

William St

Heavys	Trucks	Cars	Totals
0	2	89	91

Cars	Trucks	Heavys	Totals
4	0	0	4
75	2	0	77
158	3	0	161
237	5	0	

George St

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	2	2
0	2	59	61
0	0	10	10
0	2	71	

George St

Cars	Trucks	Heavys	Totals
198	4	2	204

William St

Peds Cross: ⋈
West Peds: 3
West Entering: 73
West Leg Total: 164

Cars	169
Trucks	3
Heavys	0
Totals	172

Cars	13	5	137	155
Trucks	0	0	2	2
Heavys	0	0	2	2
Totals	13	5	141	

Peds Cross: ⋈
South Peds: 3
South Entering: 159
South Leg Total: 331

Comments

William St @ George St

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Port Stanley
Site #: 0000000003
Intersection: George St & William St
TFR File #: 3
Count date: 20-Aug-2015

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Hank

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

Major Road: George St runs W/E

North Leg Total: 16
North Entering: 7
North Peds: 19
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	1	1	5	7
Totals	1	1	5	

Heavys	0
Trucks	0
Cars	9
Totals	9

East Leg Total: 423
East Entering: 275
East Peds: 4
Peds Cross: ⋈

William St

Heavys	Trucks	Cars	Totals
0	1	103	104

Cars	Trucks	Heavys	Totals
7	0	0	7
83	1	0	84
184	0	0	184
274	1	0	

George St

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
1	1	43	45
0	1	13	14
1	2	56	

George St

Cars	Trucks	Heavys	Totals
144	2	2	148

William St

Peds Cross: ⋈
West Peds: 12
West Entering: 59
West Leg Total: 163

Cars	198
Trucks	1
Heavys	0
Totals	199

Cars	19	2	96	117
Trucks	0	0	1	1
Heavys	0	0	1	1
Totals	19	2	98	

Peds Cross: ⋈
South Peds: 13
South Entering: 119
South Leg Total: 318

Comments

William St @ George St

Total Count Diagram

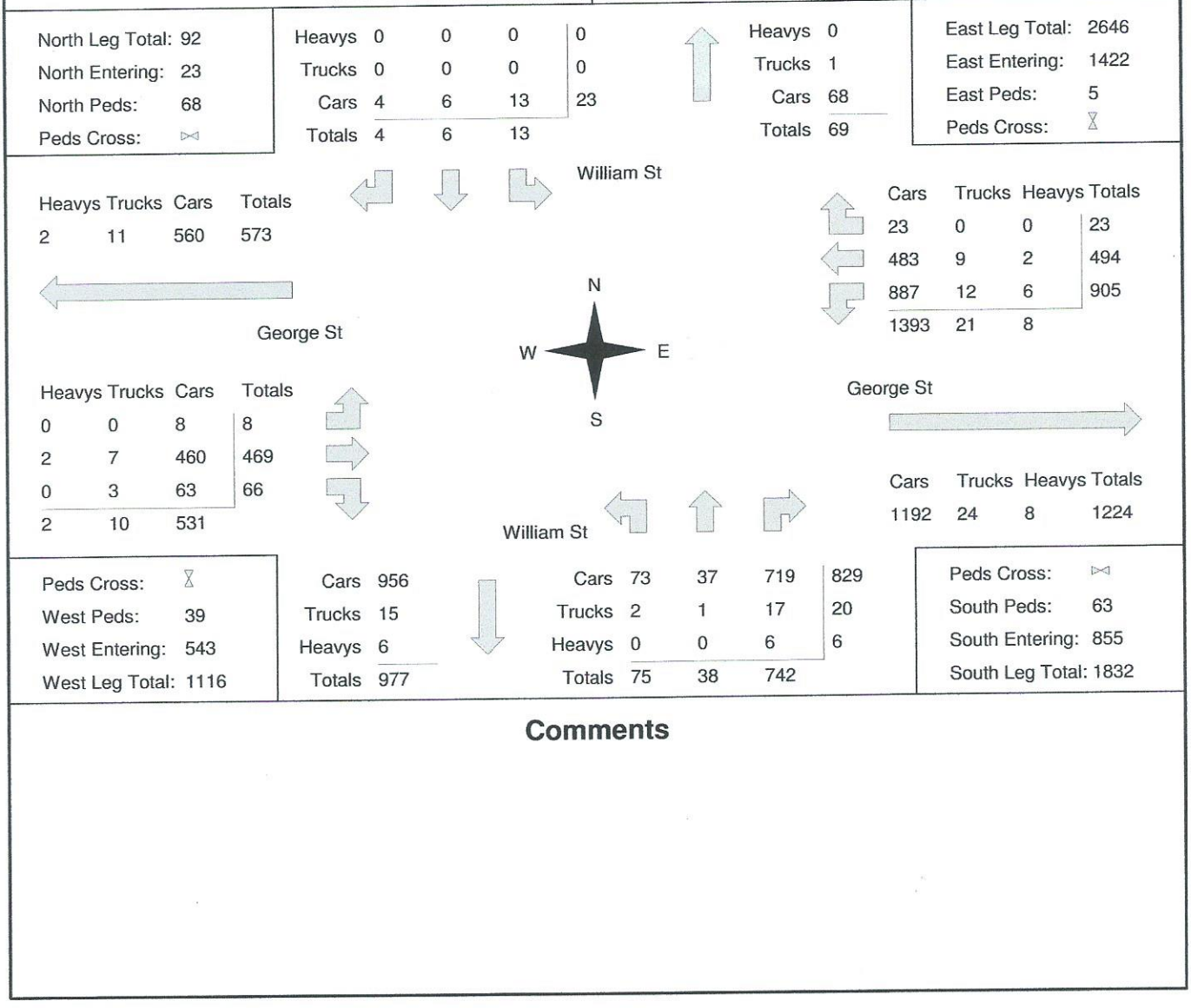
Municipality: Port Stanley
Site #: 0000000003
Intersection: George St & William St
TFR File #: 3
Count date: 20-Aug-2015

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Hank

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

Major Road: George St runs W/E



Comments

William St @ George St

Municipality: Port Stanley
Major Road: George St
Minor Road: William St

Date: Aug 20, 2015

Major Road Runs: East/West
Weather Conditions: Cloudy/Dry
Person No. 1 Hank
Person No. 2

Period Ending	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.		
	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	15	60
7:15	0	0	0	0	0	0	0	5	3	0	0	0	0	0	0	1	6	0	0	1	0	0	18	0	0	0	0	0	34	
7:30	0	0	0	0	0	0	0	5	2	0	0	0	0	0	1	0	6	0	0	0	0	0	12	1	0	0	0	0	27	
7:45	0	0	0	0	0	0	1	5	4	0	0	0	0	0	0	0	15	0	0	0	0	0	10	0	0	0	0	1	34	
8:00	0	0	0	0	0	0	0	7	5	0	0	2	0	0	0	0	8	0	0	0	0	1	17	2	0	0	0	0	42	137
8:15	0	0	0	0	0	0	1	11	4	0	0	0	0	0	0	2	10	0	0	0	1	0	13	2	0	0	0	1	42	145
8:30	1	0	0	0	0	0	1	10	7	1	1	0	0	0	0	0	11	0	1	0	1	0	18	1	0	0	0	0	51	169
8:45	0	0	0	0	0	0	0	14	9	0	0	0	0	0	0	1	17	0	0	0	0	0	17	2	0	0	0	0	60	195
9:00	0	0	0	0	0	0	0	11	8	0	1	0	0	0	1	0	11	0	0	0	1	0	15	1	0	0	0	0	48	201
11:15	1	0	0	0	0	0	3	12	8	1	0	0	0	0	4	2	21	0	0	0	4	1	11	3	0	0	0	3	64	
11:30	2	0	0	0	0	0	2	27	16	0	0	0	0	1	0	4	20	0	0	0	0	1	21	2	0	0	0	1	93	
11:45	0	0	0	0	0	0	2	23	12	0	1	0	0	0	1	4	22	0	0	1	0	0	13	3	0	0	0	2	80	
12:00	0	0	1	0	0	0	2	26	17	0	2	2	0	0	4	5	19	0	0	1	1	0	16	2	0	0	0	1	95	332
12:15	0	0	0	0	0	0	0	38	13	0	2	1	0	0	0	1	13	1	0	2	0	0	13	1	0	1	1	2	87	355
12:30	0	0	0	0	0	0	0	24	11	1	2	1	0	0	4	1	18	0	0	4	2	0	10	5	0	1	0	0	82	344
12:45	0	1	0	0	0	0	0	22	28	1	0	1	0	0	1	4	29	0	0	1	6	1	17	2	0	0	0	1	108	372
13:00	0	2	0	0	0	0	0	38	13	0	2	1	0	0	3	3	20	0	0	1	4	2	18	3	0	1	0	1	107	384
13:15	0	0	0	0	0	0	1	42	15	1	0	0	0	0	2	0	33	0	0	0	0	1	13	4	0	1	0	1	112	409
13:30	0	0	1	0	0	0	6	32	18	0	2	0	0	0	5	2	31	0	0	3	0	0	16	0	0	0	0	0	110	437
13:45	1	1	0	0	0	0	2	38	17	2	1	1	0	0	2	0	33	0	0	1	2	1	16	3	0	1	0	0	118	447
14:00	1	0	0	0	0	0	7	46	25	1	0	1	0	0	4	3	40	0	0	0	1	0	14	3	0	0	0	2	138	478
15:15	1	0	0	0	0	0	2	35	14	1	0	0	0	0	1	0	43	0	0	2	2	0	17	2	0	0	0	2	116	
15:30	0	0	1	0	0	0	2	27	20	0	1	0	0	0	4	1	24	0	0	0	0	0	16	1	0	0	0	0	95	
15:45	0	0	0	0	0	0	1	42	24	0	0	0	0	0	6	0	27	0	0	1	9	0	20	0	0	0	1	4	121	
16:00	0	0	0	0	0	0	4	35	18	3	1	0	0	0	1	0	35	0	0	1	0	0	18	2	0	0	0	2	114	446
16:15	0	0	0	0	0	0	11	36	20	0	0	0	0	0	2	0	30	0	0	1	6	0	20	3	0	0	0	3	112	442
16:30	0	0	0	0	0	0	0	30	26	2	2	0	0	0	5	1	34	0	0	0	0	0	10	1	0	0	0	0	111	458
16:45	1	1	0	0	0	0	1	29	20	2	0	0	0	0	0	0	25	1	0	1	5	0	11	1	0	1	0	0	93	430
17:00	0	0	0	0	0	0	0	33	23	0	0	0	0	0	3	0	22	0	0	0	5	0	7	0	0	1	0	0	89	405
17:15	0	0	0	0	0	0	4	38	21	0	0	0	0	0	4	0	23	0	0	1	2	0	9	2	0	1	0	0	99	392
17:30	2	0	1	0	0	0	2	48	24	1	0	0	0	1	7	0	21	0	0	0	2	0	12	5	0	1	0	1	122	403
17:45	1	0	0	0	0	0	6	51	22	2	0	1	0	0	4	1	25	0	0	0	6	0	12	4	0	0	0	6	123	433
18:00	2	1	0	0	0	0	7	47	16	4	0	0	0	3	4	1	27	0	0	1	3	0	10	2	0	0	1	5	116	460

William St @ Erie St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Port Stanley
Site #: 0000000002
Intersection: William St & Erie St
TFR File #: 2
Count date: 19-Aug-2015

Weather conditions:
Clear/Dry

Person(s) who counted:
Hank

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

Major Road: William St runs N/S

North Leg Total: 109
North Entering: 57
North Peds: 0
Peds Cross: ⋈

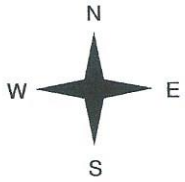
Heavys	0	1	0	1
Trucks	0	3	0	3
Cars	2	51	0	53
Totals	2	55	0	

Heavys	0
Trucks	2
Cars	50
Totals	52

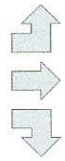
East Leg Total: 11
East Entering: 7
East Peds: 7
Peds Cross: ⋈

Heavys	Trucks	Cars	Totals
0	0	3	3

Cars	Trucks	Heavys	Totals
5	0	0	5
1	0	0	1
1	0	0	1
7	0	0	



Heavys	Trucks	Cars	Totals
0	0	4	4
0	0	3	3
0	0	0	0
0	0	7	



Cars	Trucks	Heavys	Totals
4	0	0	4

Peds Cross: ⋈
West Peds: 18
West Entering: 7
West Leg Total: 10

Cars	52
Trucks	3
Heavys	1
Totals	56

Cars	0	41	1	42
Trucks	0	2	0	2
Heavys	0	0	0	0
Totals	0	43	1	

Peds Cross: ⋈
South Peds: 0
South Entering: 44
South Leg Total: 100

Comments

William St @ Erie St

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:30:00
To: 12:30:00

Municipality: Port Stanley
Site #: 0000000002
Intersection: William St & Erie St
TFR File #: 2
Count date: 19-Aug-2015

Weather conditions:
Clear/Dry

Person(s) who counted:
Hank

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

Major Road: William St runs N/S

North Leg Total: 396
North Entering: 272
North Peds: 2
Peds Cross: ⋈

Heavys	0	3	0	3
Trucks	0	2	1	3
Cars	10	247	9	266
Totals	10	252	10	

Heavys	3
Trucks	2
Cars	119
Totals	124

East Leg Total: 39
East Entering: 21
East Peds: 3
Peds Cross: ⧖

William St

Heavys	Trucks	Cars	Totals
0	0	12	12

Cars	Trucks	Heavys	Totals
7	0	0	7
0	0	0	0
14	0	0	14
21	0	0	

Erie St

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	1	1
0	0	2	2
0	0	3	3
0	0	6	

Erie St

Cars	Trucks	Heavys	Totals
17	1	0	18

William St

Peds Cross: ⧖
West Peds: 24
West Entering: 6
West Leg Total: 18

Cars	264
Trucks	2
Heavys	3
Totals	269

Cars	2	111	6	119
Trucks	0	2	0	2
Heavys	0	3	0	3
Totals	2	116	6	

Peds Cross: ⋈
South Peds: 1
South Entering: 124
South Leg Total: 393

Comments

William St @ Erie St

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Port Stanley
Site #: 0000000002
Intersection: William St & Erie St
TFR File #: 2
Count date: 19-Aug-2015

Weather conditions:
Clear/Dry

Person(s) who counted:
Hank

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

Major Road: William St runs N/S

North Leg Total: 416
North Entering: 242
North Peds: 6
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	16	222	4	242
Totals	16	222	4	

Heavys	0
Trucks	0
Cars	174
Totals	174

East Leg Total: 27
East Entering: 17
East Peds: 15
Peds Cross: ⋈

William St

Heavys	Trucks	Cars	Totals
0	0	25	25

Erie St

Cars	Trucks	Heavys	Totals
3	0	0	3
6	0	0	6
8	0	0	8
17	0	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	4	4
0	0	3	3
0	0	1	1
0	0	8	

Erie St

Cars	Trucks	Heavys	Totals
10	0	0	10

William St

Peds Cross: ⋈
West Peds: 43
West Entering: 8
West Leg Total: 33

Cars	231
Trucks	0
Heavys	0
Totals	231

Cars	3	167	3	173
Trucks	0	0	0	0
Heavys	0	0	0	0
Totals	3	167	3	

Peds Cross: ⋈
South Peds: 1
South Entering: 173
South Leg Total: 404

Comments

William St @ Erie St

Total Count Diagram

Municipality: Port Stanley
Site #: 0000000002
Intersection: William St & Erie St
TFR File #: 2
Count date: 19-Aug-2015

Weather conditions:
Clear/Dry

Person(s) who counted:
Hank

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

Major Road: William St runs N/S

North Leg Total:	2287			
North Entering:	1229			
North Peds:	15			
Peds Cross:	⋈			

Heavys	0	12	0	12
Trucks	0	15	1	16
Cars	56	1114	31	1201
Totals	56	1141	32	

Heavys	13
Trucks	17
Cars	1028
Totals	1058

East Leg Total:	205
East Entering:	127
East Peds:	101
Peds Cross:	⧖

William St

Heavys	Trucks	Cars	Totals
0	0	95	95

Cars	Trucks	Heavys	Totals
30	0	1	31
16	0	0	16
79	0	1	80
125	0	2	

Erie St

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	34	35
0	0	14	14
0	0	10	10
0	1	58	

Erie St

Cars	Trucks	Heavys	Totals
76	2	0	78

William St

Peds Cross:	⧖			
West Peds:	199			
West Entering:	59			
West Leg Total:	154			

Cars	1203			
Trucks	15			
Heavys	13			
Totals	1231			

Cars	23	964	31	1018
Trucks	0	16	1	17
Heavys	0	12	0	12
Totals	23	992	32	

Peds Cross:	⋈
South Peds:	28
South Entering:	1047
South Leg Total:	2278

Comments

William St @ Erie St

Municipality: Port Stanley
Major Road: William St
Minor Road: Erie St

Date: Aug 19, 2015

Major Road Runs: North/South
Weather Conditions: Clear/Dry
Person No. 1 Hank
Person No. 2

Period Ending	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.		
	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	15	60
7:15	0	5	0	0	0	0	0	1	0	1	0	0	0	0	0	6	0	0	0	0	0	0	1	0	0	0	0	8	14	
7:30	0	5	0	0	2	0	0	0	1	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	1	11	
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	2	6	
8:00	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	0	1	0	0	0	0	0	3	8	39
8:15	0	11	0	0	0	0	0	0	0	2	0	0	0	0	0	11	1	0	0	0	0	1	0	0	0	0	0	4	26	51
8:30	0	10	0	0	0	0	0	1	0	1	0	0	0	3	0	8	0	0	0	0	0	1	1	0	0	0	0	3	22	62
8:45	0	18	0	0	2	0	0	0	1	1	0	0	0	4	0	15	0	0	1	0	0	2	0	0	0	0	0	3	40	96
9:00	0	12	2	0	2	0	0	0	0	1	0	0	0	0	0	7	0	0	1	0	0	0	2	0	0	0	0	8	27	115
11:15	1	28	1	0	0	0	0	5	0	0	0	0	0	2	0	10	0	0	1	0	1	1	1	0	0	0	0	6	48	
11:30	0	40	1	0	2	0	0	4	1	2	0	0	0	2	0	24	2	0	0	0	1	0	0	0	0	0	0	0	76	
11:45	1	68	4	0	1	0	2	5	0	3	0	0	0	0	1	26	0	0	1	0	1	1	1	2	0	0	0	3	114	
12:00	2	69	2	0	2	0	0	1	0	1	0	0	0	0	1	33	2	0	2	0	0	0	1	1	0	0	0	7	117	355
12:15	4	46	3	1	0	0	0	5	0	2	0	0	0	1	0	17	2	0	1	0	0	0	0	0	0	0	0	6	81	388
12:30	2	64	1	0	2	0	0	3	0	1	0	0	0	2	0	35	2	0	1	0	0	0	0	0	0	0	0	8	111	423
12:45	0	59	2	0	1	0	0	2	0	1	0	0	0	2	0	36	2	0	0	0	0	1	0	0	0	0	0	10	104	413
13:00	0	29	0	0	0	0	0	6	0	0	0	0	0	8	0	29	1	0	1	0	5	1	0	0	0	0	0	5	67	363
13:15	0	24	2	0	0	0	0	5	0	0	0	0	0	0	5	27	1	0	4	0	4	1	2	0	1	0	0	5	72	354
13:30	4	44	0	0	3	0	0	4	0	0	0	0	0	11	2	49	1	0	1	0	0	0	0	1	0	0	0	4	109	352
13:45	1	42	0	0	4	0	0	6	0	1	0	0	1	6	2	31	2	0	5	1	2	2	0	0	0	0	0	2	98	346
14:00	1	41	1	0	1	0	4	6	0	1	0	0	0	4	1	55	2	0	0	0	0	2	0	0	0	0	0	4	111	390
15:15	2	31	1	0	0	0	0	2	0	3	0	0	0	8	0	41	3	0	0	0	0	2	0	0	0	0	0	12	85	
15:30	1	35	1	0	0	0	3	2	1	0	0	0	0	6	1	50	0	0	1	0	1	1	1	1	0	0	0	16	95	
15:45	2	37	0	0	0	0	0	2	0	1	0	0	0	5	3	53	4	0	0	0	7	4	0	1	0	0	0	9	107	
16:00	2	43	8	0	3	0	0	3	1	2	0	0	0	4	0	47	1	0	1	0	0	0	0	1	0	0	0	9	112	399
16:15	1	17	1	0	1	0	0	0	1	1	0	0	0	7	1	33	0	0	3	0	0	1	0	0	0	0	0	4	60	374
16:30	0	36	2	0	1	0	0	3	2	0	1	0	0	0	2	55	0	0	1	0	4	3	0	0	0	0	0	1	106	385
16:45	1	33	5	0	0	0	0	2	1	1	0	0	0	9	1	48	2	0	1	0	0	2	1	1	0	0	0	7	99	377
17:00	2	42	3	0	0	0	0	3	1	1	0	0	0	1	0	41	0	0	2	0	0	0	0	1	0	0	0	6	96	361
17:15	2	44	7	0	0	0	4	2	1	1	0	0	0	6	0	43	0	0	0	0	0	1	1	0	0	0	0	8	102	403
17:30	1	54	0	0	0	0	2	3	1	0	0	0	0	4	3	46	3	0	0	0	0	1	0	1	0	0	0	13	113	410
17:45	0	54	3	0	0	0	0	2	1	1	0	0	0	3	0	34	0	0	0	0	1	1	1	0	0	0	0	11	97	408
18:00	1	70	6	0	0	0	0	1	3	1	0	0	0	2	0	44	0	0	0	0	0	1	1	0	0	0	0	11	128	440

APPENDIX B

PHOTOGRAPHS OF FIRST STREET

First Street
Looking South from Erie Street

First Street
Looking North from Site Access

APPENDIX C

LEVEL OF SERVICE ANALYSIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	63	6	48	28	1	1	4	49	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	68	7	52	30	1	1	4	53	1	0	0
Pedestrians		1						3			2	
Lane Width (m)		3.6						3.6			3.6	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	34			78			211	213	75	211	215	34
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	34			78			211	213	75	211	215	34
tC, single (s)	4.1			4.1			7.1	6.8	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	99	95	100	100	100
cM capacity (veh/h)	1589			1504			726	621	990	684	659	1042

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	75	52	32	59	1
Volume Left	0	52	0	1	1
Volume Right	7	0	1	53	0
cSH	1589	1504	1700	942	684
Volume to Capacity	0.00	0.03	0.02	0.06	0.00
Queue Length 95th (m)	0.0	0.9	0.0	1.6	0.0
Control Delay (s)	0.0	7.5	0.0	9.1	10.3
Lane LOS		A		A	B
Approach Delay (s)	0.0	4.7		9.1	10.3
Approach LOS				A	B

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	20.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	70	10	55	30	1	1	5	55	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	76	11	60	33	1	1	5	60	1	0	0
Pedestrians		1						5			5	
Lane Width (m)		3.6						3.6			3.6	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	39			92			240	245	87	242	250	39
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	39			92			240	245	87	242	250	39
tC, single (s)	4.1			4.1			7.1	6.8	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	99	94	100	100	100
cM capacity (veh/h)	1578			1484			689	590	974	640	625	1033

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	87	60	34	66	1
Volume Left	0	60	0	1	1
Volume Right	11	0	1	60	0
cSH	1578	1484	1700	918	640
Volume to Capacity	0.00	0.04	0.02	0.07	0.00
Queue Length 95th (m)	0.0	1.0	0.0	1.9	0.0
Control Delay (s)	0.0	7.5	0.0	9.2	10.6
Lane LOS		A		A	B
Approach Delay (s)	0.0	4.8		9.2	10.6
Approach LOS				A	B

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	70	10	61	30	1	1	5	77	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	76	11	66	33	1	1	5	84	1	0	0
Pedestrians		1						5			5	
Lane Width (m)		3.6						3.6			3.6	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	39			92			253	258	87	255	263	39
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	39			92			253	258	87	255	263	39
tC, single (s)	4.1			4.1			7.1	6.8	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	99	91	100	100	100
cM capacity (veh/h)	1578			1484			673	577	974	609	612	1033

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	87	66	34	90	1
Volume Left	0	66	0	1	1
Volume Right	11	0	1	84	0
cSH	1578	1484	1700	930	609
Volume to Capacity	0.00	0.04	0.02	0.10	0.00
Queue Length 95th (m)	0.0	1.1	0.0	2.6	0.0
Control Delay (s)	0.0	7.5	0.0	9.3	10.9
Lane LOS		A		A	B
Approach Delay (s)	0.0	5.0		9.3	10.9
Approach LOS				A	B

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	23.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	66	17	224	102	7	28	3	143	5	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	72	18	243	111	8	30	3	155	5	1	1
Pedestrians		12			4			13			19	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			2	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	137			103			705	718	98	707	724	146
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	137			103			705	718	98	707	724	146
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			84			90	99	84	98	100	100
cM capacity (veh/h)	1436			1485			296	291	944	246	289	884

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	90	243	118	189	8
Volume Left	0	243	0	30	5
Volume Right	18	0	8	155	1
cSH	1436	1485	1700	678	280
Volume to Capacity	0.00	0.16	0.07	0.28	0.03
Queue Length 95th (m)	0.0	4.7	0.0	9.1	0.7
Control Delay (s)	0.0	7.9	0.0	12.3	18.2
Lane LOS		A		B	C
Approach Delay (s)	0.0	5.3		12.3	18.2
Approach LOS				B	C

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	39.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	75	20	255	115	10	30	5	160	5	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	22	277	125	11	33	5	174	5	1	1
Pedestrians		15			5			15			20	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			2	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	156			118			803	818	112	805	823	165
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			118			803	818	112	805	823	165
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			81			87	98	81	97	100	100
cM capacity (veh/h)	1413			1464			247	246	925	198	245	859

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	103	277	136	212	8
Volume Left	0	277	0	33	5
Volume Right	22	0	11	174	1
cSH	1413	1464	1700	619	230
Volume to Capacity	0.00	0.19	0.08	0.34	0.03
Queue Length 95th (m)	0.0	5.6	0.0	12.1	0.8
Control Delay (s)	0.0	8.0	0.0	13.8	21.2
Lane LOS		A		B	C
Approach Delay (s)	0.0	5.4		13.8	21.2
Approach LOS				B	C

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	75	20	277	115	10	30	5	172	5	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	22	301	125	11	33	5	187	5	1	1
Pedestrians		15			5			15			20	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			2	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	156			118			851	865	112	853	871	165
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			118			851	865	112	853	871	165
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			79			86	98	80	97	100	100
cM capacity (veh/h)	1413			1464			226	226	925	178	225	859

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	103	301	136	225	8
Volume Left	0	301	0	33	5
Volume Right	22	0	11	187	1
cSH	1413	1464	1700	607	208
Volume to Capacity	0.00	0.21	0.08	0.37	0.04
Queue Length 95th (m)	0.0	6.2	0.0	13.6	0.9
Control Delay (s)	0.0	8.1	0.0	14.4	23.0
Lane LOS		A		B	C
Approach Delay (s)	0.0	5.6		14.4	23.0
Approach LOS				B	C

Intersection Summary				
Average Delay	7.6			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	3	0	1	1	5	0	43	1	0	55	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	3	0	1	1	5	0	47	1	0	60	2
Pedestrians		18			7							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		2			1							
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	132	134	79	117	134	54	80			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	132	134	79	117	134	54	80			55		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	99	100			100		
cM capacity (veh/h)	813	745	972	843	744	1013	1508			1554		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	8	48	62
Volume Left	4	1	0	0
Volume Right	0	5	1	2
cSH	783	937	1508	1554
Volume to Capacity	0.01	0.01	0.00	0.00
Queue Length 95th (m)	0.2	0.2	0.0	0.0
Control Delay (s)	9.6	8.9	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.6	8.9	0.0	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	5	0	1	1	5	0	50	1	0	60	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	5	0	1	1	5	0	54	1	0	65	5
Pedestrians		20			10							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		2			1							
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	149	153	88	136	156	65	91			65		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	149	153	88	136	156	65	91			65		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	100	99	100			100		
cM capacity (veh/h)	789	724	960	813	722	996	1492			1537		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	8	55	71
Volume Left	5	1	0	0
Volume Right	0	5	1	5
cSH	755	917	1492	1537
Volume to Capacity	0.01	0.01	0.00	0.00
Queue Length 95th (m)	0.4	0.2	0.0	0.0
Control Delay (s)	9.8	9.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.8	9.0	0.0	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	18.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	27	5	0	1	1	5	0	50	1	0	60	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	5	0	1	1	5	0	54	1	0	65	12
Pedestrians		20			10							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		2			1							
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	152	157	91	139	162	65	97			65		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	152	157	91	139	162	65	97			65		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	99	100	100	100	99	100			100		
cM capacity (veh/h)	786	721	956	809	716	996	1484			1537		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	35	8	55	77
Volume Left	29	1	0	0
Volume Right	0	5	1	12
cSH	775	915	1484	1537
Volume to Capacity	0.04	0.01	0.00	0.00
Queue Length 95th (m)	1.1	0.2	0.0	0.0
Control Delay (s)	9.9	9.0	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.9	9.0	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	24.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	3	1	8	6	3	3	167	3	4	222	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	3	1	9	7	3	3	182	3	4	241	17
Pedestrians		43			15			1			6	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	504	508	294	467	515	204	302			200		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	504	508	294	467	515	204	302			200		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	98	99	100	100			100		
cM capacity (veh/h)	436	446	723	479	441	827	1225			1367		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	18	188	263
Volume Left	4	9	3	4
Volume Right	1	3	3	17
cSH	463	501	1225	1367
Volume to Capacity	0.02	0.04	0.00	0.00
Queue Length 95th (m)	0.5	0.9	0.1	0.1
Control Delay (s)	12.9	12.5	0.2	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	12.9	12.5	0.2	0.2
Approach LOS	B	B		

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	5	1	10	10	5	5	190	5	5	250	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	5	1	11	11	5	5	207	5	5	272	22
Pedestrians		50			20			1			10	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			2			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	584	586	334	538	594	239	343			232		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	584	586	334	538	594	239	343			232		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	97	97	99	100			100		
cM capacity (veh/h)	374	397	683	421	393	785	1176			1325		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	12	27	217	299
Volume Left	5	11	5	5
Volume Right	1	5	5	22
cSH	401	450	1176	1325
Volume to Capacity	0.03	0.06	0.00	0.00
Queue Length 95th (m)	0.7	1.5	0.1	0.1
Control Delay (s)	14.3	13.5	0.2	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	14.3	13.5	0.2	0.2
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	17	5	1	10	10	5	5	190	5	5	250	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	5	1	11	11	5	5	207	5	5	272	46
Pedestrians		50			20			1			10	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			2			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	596	598	346	550	618	239	367			232		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	596	598	346	550	618	239	367			232		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	99	100	97	97	99	100			100		
cM capacity (veh/h)	367	391	672	413	381	785	1152			1325		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	25	27	217	323
Volume Left	18	11	5	5
Volume Right	1	5	5	46
cSH	379	440	1152	1325
Volume to Capacity	0.07	0.06	0.00	0.00
Queue Length 95th (m)	1.7	1.6	0.1	0.1
Control Delay (s)	15.2	13.7	0.2	0.2
Lane LOS	C	B	A	A
Approach Delay (s)	15.2	13.7	0.2	0.2
Approach LOS	C	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		