DOWNTOWN TRAFFIC STUDY
PROJECT FILE REPORT
SCHEDULE B MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Submitted to The Corporation of the City of Sault Ste. Marie

Appendix 3 – Downtown Traffic Study Report

November 16, 2018

Appendix 3

Sault Ste. Marie
Downtown Traffic Study - Traffic Analysis Report

Prepared for the City of Sault Ste. Marie
by IBI Group

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1 Introduction

The City of Sault Ste. Marie ("the City") has retained IBI Group to examine the potential for converting roads within its downtown core from one-way to two-way operation. This report provides a traffic analysis of the downtown including analysis of the alternatives under consideration in the Environmental Assessment (EA).

1.1 Background

The downtown is immediately south-east of the International Bridge connecting to Sault Ste. Marie, Michigan and was historically the gateway with which vehicles going to and from the United States would pass through. When the one-way pairs were introduced, the downtown was the "centre of the community", home to various destinations. At that time, the downtown needed one-way streets to serve traffic volumes generated by these and other land uses to and through the area.

In 2005 the construction of Carmen's Way, which provides a connection to the Trans-Canada Highway via Second Line and Great Northern Road, shifted traffic patterns away from the downtown to suburban locations.

While the downtown is still a viable business district, the reduction in vehicular through it has raised the question of whether one-way pairs still best serve the area. This study seeks to determine if the one-way streets are relevant, while also considering the City's desire to revitalize the downtown and improve safety for pedestrians and cyclists.

1.2 Study Area

The study area was determined by the City and includes all one-way streets in the downtown core. These streets are all grouped in one-way couplets for opposing direction of travel, with the exception of East Street. A map of the full study area is shown in Exhibit 1-1 with arrows showing the locations of the one-way couplets.

Exhibit 1-1: Map of Study Area

A screenline was placed between Brock Street and East Street to evaluate traffic volume on Wellington Street, Albert Street, Queen Street and Bay Street. The screenline is displayed as a black dashed line in Exhibit 1-1.

1.3 Approach

This report provides traffic input into the overall project summary report. The main methodology used is a capacity-based review of each alternative (one-way vs two-way traffic) across the Easts Street screenline, which is where traffic volumes are generally highest eastbound in the a.m. and westbound in the p.m. The screenline-based method involved calculating volume-to-capacity ratios for each corridor and overall. This was done for existing conditions and for each alternative. The screenline method provides a direct and simple approach to identifying specific problem locations plus overall capacity constraints if any. The approach was supplemented with a Synchro analysis of existing conditions along Queen Street and Bay Street, to identify any specific problem locations and to provide input into the capacity analysis.

2 Existing Conditions

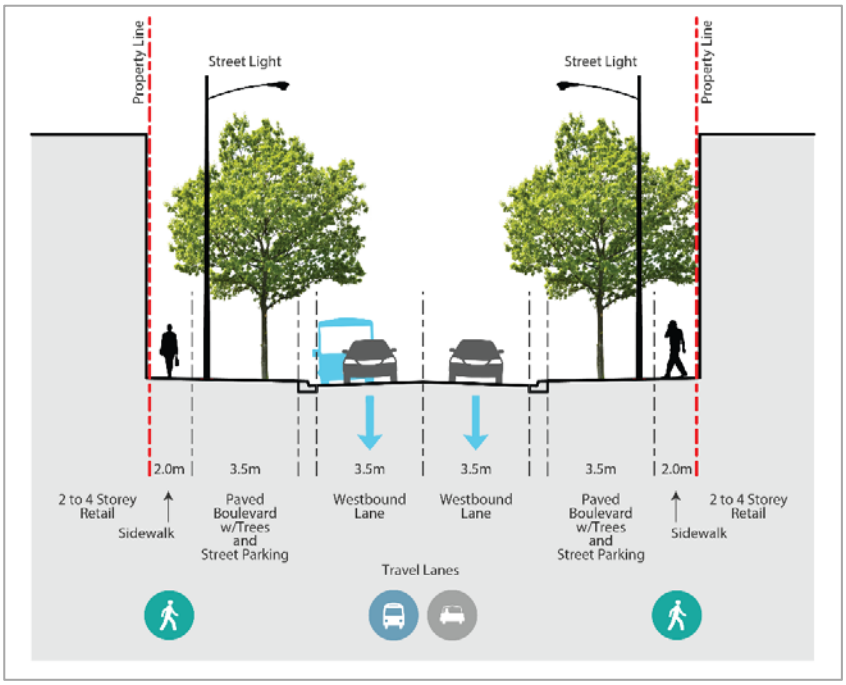
2.1 Existing Road Network

Within the study area, the two one-way pairs running east-west across the downtown core were selected for analysis.

Queen Street East is a two lane major arterial road under the jurisdiction of the City of Sault Ste. Marie. The entire length of Queen Street operates as a one-way street servicing westbound traffic. It connects the City's current eastern limits at Fournier Road to West Street. The Queen Street corridor, in addition to being an important transportation route is a major commercial area and provides access to roadways and commercial properties throughout the City's downtown

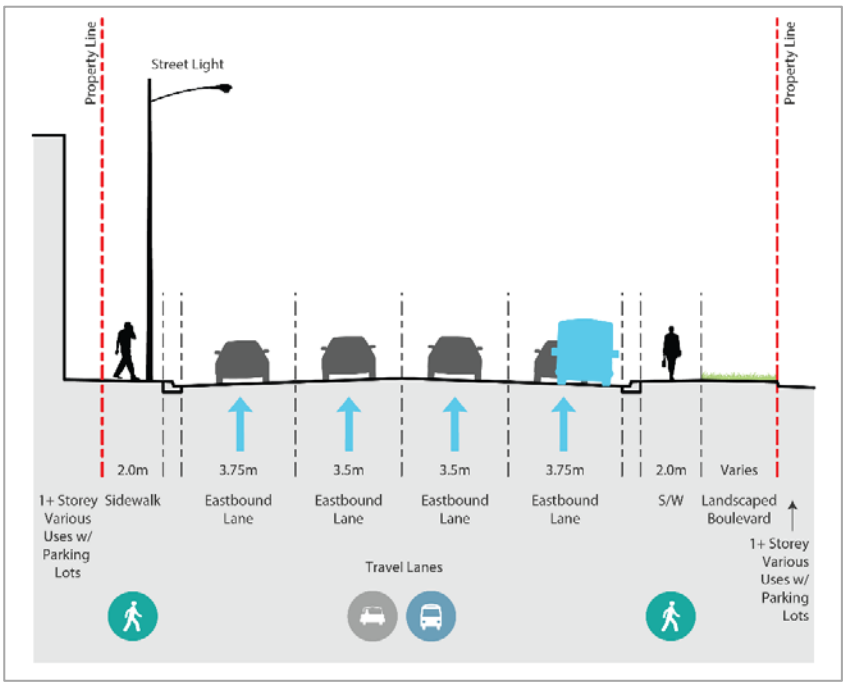
core. With no signage present, a speed limit of 50 km/h is assumed. Exhibit 2-1 displays the existing cross section of Queen Street East at Brock Street.

Exhibit 2-1: Existing Cross Section of Queen Street East



Bay Street is a four lane major arterial road under the jurisdiction of the City of Sault Ste. Marie. The entire length of Bay Street operates as a one-way street servicing eastbound traffic. Bay Street connects Huron Street on the west to Pim Street on the east. The Bay Street corridor, in addition to being an important transportation route is a major commercial area and provides access to roadways and commercial properties throughout the downtown core. With no signage present, a speed limit of 50 km/h is assumed. Exhibit 2-2 displays the existing cross section of Bay Street at Dennis Street.

Exhibit 2-2: Existing Cross Section of Bay Street



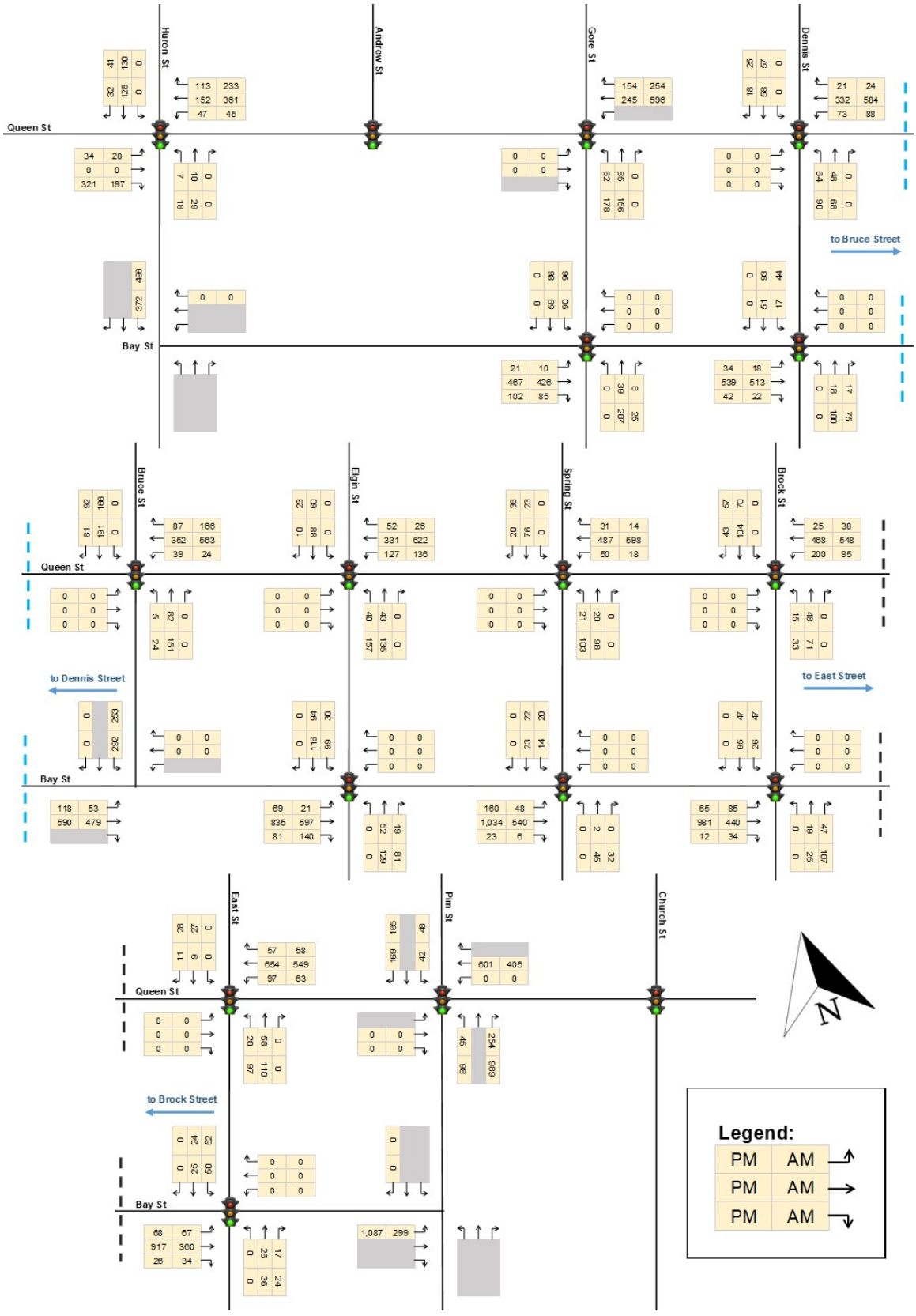
Wellington Street East is a two lane one-way collector road under the jurisdiction of the City of Sault Ste. Marie. Within the study limits, Wellington Street serves westbound traffic and is bounded by small residential areas. With no signage present, a speed limit of 50 km/h is assumed.

Albert Street East is a two lane one-way collector road under the jurisdiction of the City of Sault Ste. Marie. Within the study limits, Albert Street serves the eastbound traffic and is bounded by small residential areas. With no signage present, a speed limit of 50 km/h is assumed.

2.2 Traffic Volumes

Turning movement counts (TMCs) were collected in 2017 by the City. Available traffic volumes along Queen Street East and Bay Street during weekday a.m. and p.m. peak hours are illustrated in Exhibit 2-3. Limited traffic data was also collected and provided along Albert Street and Wellington Street for use in the screenline analysis. The TMC data are provided in Appendix A.

Exhibit 2-3: Existing (2017) Traffic Volumes



2.3 Traffic Analysis

An existing conditions traffic analysis was conducted using Synchro (version 9) and following Highway Capacity Manual (HCM 2000) methodologies of intersection operations analysis. This analysis was done for Queen Street and Bay Street only, as they were the two corridors under consideration for conversion to two-way following the preliminary screening of alternatives (see project summary report). Analysis periods are limited to the weekday a.m. and p.m. peak hours, when site traffic and background traffic will be highest.

Critical movements were identified by satisfying any one of the following criteria:

- 95th percentile queue length exceeding provided storage length;
- Individual movements or shared movements with a LOS of “C” or worse; and
- Volume to capacity ratio (v/c) of 0.8 or greater.

Level-of-service (LOS) is a measure of performance based on control delay, as defined in Exhibit 2-4.

Exhibit 2-4: Intersection LOS Reference

HCM	Control Delay Per Vehicle (S)	
LOS	Signalized	Unsignalized
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

A summary of the Synchro analysis including v/c ratio is displayed in Exhibit 2-5 with detailed outputs provided in Appendix B.

The analysis of the existing conditions show that current traffic operations are operating with no critical movements represented by unusual long delays or long queues. Generally the traffic operates well where drivers rarely if ever require multiple cycles of traffic signals to cross an intersection. It should be noted that traffic was not analyzed for before and after Greyhound Games or other events as they are considered short duration irregular events. While the analysis shows good traffic operations, it was noted that northbound and southbound movements have a higher control delay than eastbound and westbound movements, as north/south traffic tends to wait longer for a green signal or for a gap in traffic.

Exhibit 2-5: Summary of Synchro Analysis with Critical Movements

Intersection	AM Peak				PM Peak			
	Mvmt	LOS	V/C	Intersection Delay (sec)	Mvmt	LOS	V/C	Intersection Delay (sec)
Queen St & Pim St	no critical movements				no critical movements			
Queen St & East St	SBT	C	0.02	22	SBT	C	0.06	23
Queen St & Brock St	NBL	C	0.27	27	NBL	C	0.14	22
	NBT	C	0.31	27	NBT	C	0.37	23
	SBT	C	0.23	25	SBT	C	0.15	24
Queen St & Spring St	SBT	C	0.14	21	NBL	C	0.26	24
					NBT	C	0.19	22
					SBT	C	0.04	20
Queen St & Elgin St	SBT	C	0.20	25	SBT	C	0.14	24
Queen St & Bruce St	SBT	C	0.38	25	SBT	C	0.33	24
					WBL	C	0.04	21
					WBT	C	0.40	22
Queen St & Dennis St	NBT	C	0.08	21	NBL	C	0.20	26
					NBT	D	0.10	36
Queen St & Gore St	no critical movements				WBL	C	0.55	22
Bay St & East St	SBL	C	0.13	24	SBL	C	0.14	23
	SBT	C	0.04	22	SBT	C	0.04	21
Bay St & Brock St	SBL	C	0.06	25	SBL	C	0.11	25
	SBT	C	0.17	25	SBT	C	0.09	24
Bay St & Spring St	NBT	C	0.00	24	NBT	C	0.11	26
Bay St & Elgin St	NBT	C	0.11	21	NBT	C	0.25	23
	SBT	C	0.15	23	SBT	C	0.12	23
Bay St & Ron Francis Way	SBL	C	0.26	28	SBL	C	0.22	26
Bay St & Dennis St	NBT	C	0.05	23	NBT	C	0.24	26
	SBT	C	0.07	25	SBT	C	0.14	24
Bay St & St Mary's River Dr / Gore St	no critical movements				NBT	C	0.34	21
					SBL	C	0.28	21

3 Traffic Forecasts

To evaluate the future traffic conditions of the downtown core, Sault Ste. Marie's Transportation Master Plan was reviewed. The plan indicates that the City is unlikely to experience significant population growth over the next 18 years and as a result, significant traffic volume increases are unlikely.

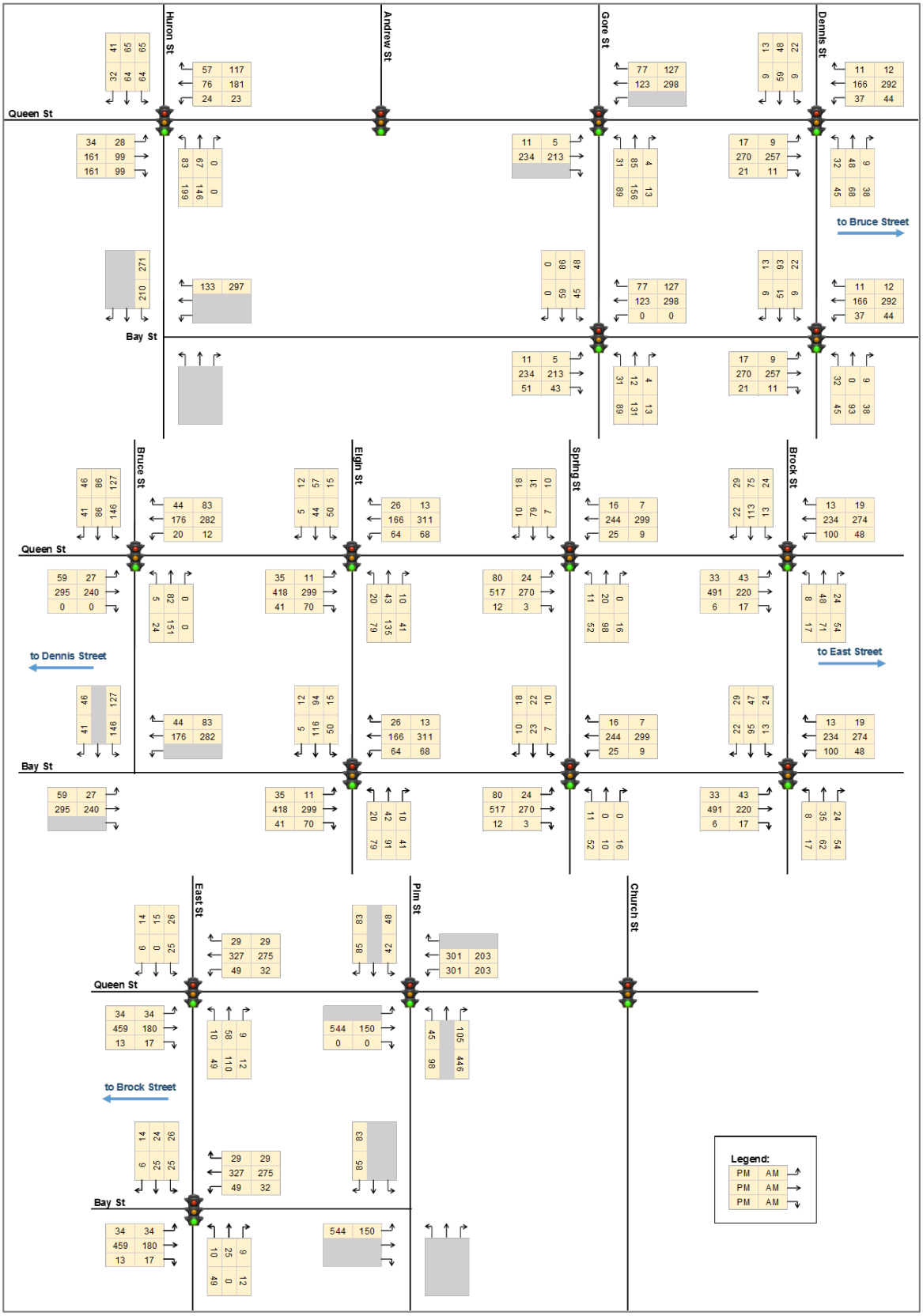
The City's Transportation Master Plan recommends to assume a 0% background traffic growth to simplify calculation and to reflect the overall stability in population levels. In addition, an

EMME model provided by the City projects that there will be zero growth on Bay and Queen Street beyond 20 years of this study. Therefore, the existing traffic counts are carried forward for future conditions.

3.1 Two-Way Traffic Volumes

To estimate two-way traffic volumes, traffic from the existing one-way streets was re-distributed depending on the alternative under consideration. Generally it was felt that travel times in the downtown would be fairly consistent between alternatives as a desirable base input. This means that the City would in conversion try to maintain good traffic operations (e.g. along Bay Street and Queen Street) so that neither Street would be faster than the other. This basis would result in conversion of streets having an even re-distribution of traffic. For each couplet, two-way traffic was developed using a 50% re-distribution from the other street. The couplets used were Queen Street and Bay Street as the first, and Wellington Street and Albert Street as the second. Overall this simple approach assumes that if Bay Street and Queen Street were converted to two-way traffic, they would both share an even amount of traffic. Exhibit 3-1 displays the traffic volumes of the downtown road network after two-way conversion.

Exhibit 3-1: Forecasted Traffic Volumes after Two-Way Conversion



4 Two-Way Traffic Operations

Traffic volumes from the screenline between Brock Street and East Street, shown in Exhibit 1-1, were used to determine the network performance for each two-way conversion alternative. The traffic volumes were compared to the road's capacity (volume to capacity ratio, v/c), which is based its number of lanes and directional operation. From the Highway Capacity Manual and local conditions review, the lane capacity of a one-way street was determined to be approximately 1,000 passenger car units per hour (pcu/hr) and the lane capacity of a two-way street is 800 pcu/hr. When traffic volumes are close to the roadway's capacity (i.e. v/c > 0.8), motorists can experience some long queues and delays. When traffic volumes are above the roadway's capacity (i.e. v/c > 1.0), traffic flows becomes unstable with excessive queues and delays.

4.1 Two-Way Traffic Alternatives

A total of six (6) alternatives with different traffic network configurations were considered. Exhibit 4-1 summarizes the traffic operational performance of each alternative, with movements approaching capacity highlighted in yellow (0.8 < v/c > 1.0) and over capacity highlighted in red (v/c ≥ 1).

Alternative 1 – "Do Nothing"

Alternative 1 keeps all roads as one-way street and incorporates the *Bay Street Environmental Assessment* recommendation to reduce Bay Street to three lanes with a Multi-Use Path (MUP). A lane reduction on Bay Street will reduce the road's capacity. As a result, the volume to capacity ratio for Bay Street increases slightly during the peak hours, but there is no significant decrease to the road network performance.

Alternative 1A – Modified Base Scenario

The modified base scenario is similar to Alternative 1 as they both keep all roads a one-way street. The difference is that 1A reduces Bay Street further to two lanes, which decreases the road capacity by half. As a result, the v/c ratio for Bay Street experiences a further increase than Alternative 1, but also does not significantly impact network performance.

Alternative 2 – Convert all roads considered in study to two-way operations

Alternative 2 converts all east-west one-way streets into two-way operation with Bay Street reduced to two lanes. The two-way conversion reduces the lane capacity of each converted road, but the shared volume distribution between one-way couplets allow the roads to operate with sufficient capacity.

Alternative 3 – Convert Bay St, Queen St, and Pim St (south of Queen St) to two-way operation

Alternative 3 converts Queen Street East and Bay Street to two-way operation. Bay Street will have two through lanes and a shared turning lane with a Multi-Use Path. In addition, Pim Street will be converted to two-way south of Queen Street. With two-way operation, the former one-way couplet of Bay Street and Queen Street East splits their eastbound and westbound traffic between each other. The two-way conversion of Bay and Queen reduces its v/c ratio, but still leaves sufficient capacity throughout the road network.

Exhibit 4-1: Summary of V/C for each Two-Way Traffic Alternatives

Alternative	Street	# of Lanes		Capacity		Volume (AM)		V/C (AM)		Volume (PM)		V/C (PM)	
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Existing Conditions	Wellington St	0	2	0	2,000	0	736	0.00	0.37	0	673	0.00	0.34
	Albert St	2	0	2,000	0	391	0	0.20	0.00	646	0	0.32	0.00
	Queen St	0	2	0	2,000	0	693	0.00	0.35	0	681	0.00	0.34
	Bay St	4	0	4,000	0	461	0	0.12	0.00	1011	0	0.25	0.00
	Total	*6*	*4*	*6,000*	*4,000*	*852*	*1,429*	*0.14*	*0.36*	*1,657*	*1,354*	*0.28*	*0.34*
Alternative 1: Base Scenario - Implement Bay Street EA (3 Lanes One-Way + MUP)	Wellington St	0	2	0	2,000	0	736	0.00	0.37	0	673	0.00	0.34
	Albert St	2	0	2,000	0	391	0	0.20	0.00	646	0	0.32	0.00
	Queen St	0	2	0	2,000	0	693	0.00	0.35	0	681	0.00	0.34
	Bay St	3	0	3,000	0	461	0	0.15	0.00	1,011	0	0.34	0.00
	Total	*5*	*4*	*5,000*	*4,000*	*852*	*1,429*	*0.17*	*0.36*	*1,657*	*1,354*	*0.33*	*0.34*
Alternative 1A: Modified Base Scenario - Implement Bay Street EA (2 Lanes One-Way + MUP)	Wellington St	0	2	0	2,000	0	736	0.00	0.37	0	673	0.00	0.34
	Albert St	2	0	2,000	0	391	0	0.20	0.00	646	0	0.32	0.00
	Queen St	0	2	0	2,000	0	693	0.00	0.35	0	681	0.00	0.34
	Bay St	2	0	2,000	0	461	0	0.23	0.00	1,011	0	0.51	0.00
	Total	*4*	*4*	*4,000*	*4,000*	*852*	*1,429*	*0.21*	*0.36*	*1,657*	*1,354*	*0.41*	*0.34*
Alternative 2: Convert All Roads to Two-Way Operation + MUP on Bay Street	Wellington St	1	1	800	800	196	368	0.24	0.46	323	337	0.40	0.42
	Albert St	1	1	800	800	196	368	0.24	0.46	323	337	0.40	0.42
	Queen St	1	1	800	800	231	347	0.29	0.43	506	341	0.63	0.43
	Bay St	1	1	800	800	231	347	0.29	0.43	506	341	0.63	0.43
	Total	*4*	*4*	*3,200*	*3,200*	*852*	*1,429*	*0.27*	*0.45*	*1,657*	*1,354*	*0.52*	*0.42*
Alternative 3: Convert Bay Street and Queen Street to Two-Way Operation* + MUP on Bay Street	Wellington St	0	2	0	2,000	0	736	0.00	0.37	0	673	0.00	0.34
	Albert St	2	0	2,000	0	391	0	0.20	0.00	646	0	0.32	0.00
	Queen St	1	1	800	800	231	347	0.29	0.43	506	341	0.63	0.43
	Bay St	1	1	800	800	231	347	0.29	0.43	506	341	0.63	0.43
	Total	*4*	*4*	*3,600*	*3,600*	*852*	*1,429*	*0.24*	*0.40*	*1,657*	*1,354*	*0.46*	*0.38*
Alternative 4: Convert Bay Street to Two-Way Operation* + MUP	Wellington St	0	2	0	2,000	0	736	0.00	0.37	0	673	0.00	0.34
	Albert St	2	0	2,000	0	391	0	0.20	0.00	646	0	0.32	0.00
	Queen St	0	2	0	2,000	0	462	0.00	0.23	0	454	0.00	0.23
	Bay St	1	1	800	800	461	231	0.58	0.29	1011	227	**1.26**	0.28
	Total	*3*	*5*	*2,800*	*4,800*	*852*	*1,429*	*0.30*	*0.30*	*1,657*	*1,354*	*0.59*	*0.28*
Alternative 5: Convert Queen Street to Two-Way Operation and Implement Bay Street EA (Bay Street 3 Lanes One-Way + MUP)	Wellington St	0	2	0	2,000	0	736	0.00	0.37	0	673	0.00	0.34
	Albert St	2	0	2,000	0	391	0	0.20	0.00	646	0	0.32	0.00
	Queen St	1	1	800	800	115	693	0.14	**0.87**	253	681	0.32	**0.85**
	Bay St	3	0	3,000	0	346	0	0.12	0.00	758	0	0.25	0.00
	Total	*6*	*3*	*5,800*	*2,800*	*852*	*1,429*	*0.15*	*0.51*	*1,657*	*1354*	*0.29*	*0.48*

Alternative 4 – Convert Bay St and Pim St (south of Queen St) to two-way operation

Alternative 4 converts Bay Street into two-way operation only and leaves the rest of the roads as-is. The conversion reduces Bay Street's capacity without distributing its eastbound traffic volume to other streets. As a result, Bay Street becomes over capacity in the eastbound direction during the PM peak hour. This is a notable finding because it points to a potential capacity constraint under conversion of Bay Street only. While traffic would tend to dissipate around the bottleneck and travel to Albert Street, the additional diversion to Albert Street may not be desirable in itself, and it would still result in Bay Street with poor traffic operations. Overall this finding points to a preference to only convert Bay Street if Queen Street is also converted.

Alternative 5 – Convert Queen St to two-way operation

Alternative 5 converts Queen Street into two-way operation only and leaves the rest of the roads as-is. The conversion reduces Queen Street's v/c ratio without distributing its westbound traffic volume to other streets. As a result, Queen Street operates near its operating capacity in the westbound direction during both the AM and the PM peak hours. While the v/c ratio is not as severe as Alternative 4, it was noted that Wellington Street may attract diverted trips which may reduce visibility on Queen Street.

Overall, it appears that the preferred solution for traffic operations under two-way conversion is to convert Bay Street and Queen Street as a pair, and not individually.

4.2 Two-Way Lane Configuration

Under two-way conversion, the existing two-lane, one-direction configuration on Queen Street would be converted to one lane per direction. While this configuration was shown to be sufficient from a network capacity perspective (if both Queen Street and Bay Street were converted together), a further issue is the treatment at intersections. If there is a limited space such that traffic is unable to bypass a stopped left-turning vehicle or stopped right-turning vehicle, there would be a negative impact to traffic operations. However, implementing left-turning lanes along Queen Street would require widening of the pavement as there are curb-bulb outs in place at many locations.

Warrants for right and left turning lanes were therefore considered rather than locating them at most intersections which might be undertaken if space were available throughout. Generally it was felt that left turn lanes would be needed along Bay Street and Queen Street at urban arterials and collector roads per the City's official plan as they correspond to busier intersections serving through traffic, buses, and trucks. Other intersections with high turning volumes should also have turning lanes. A typical threshold of 60vph could be considered for left turn lanes and 100vph for right turn lanes. Under preliminary design, further review is required for the final locations for turning lanes, however a preliminary list of recommended locations were identified as follows:

- Left and through-right configuration at Queen Street at Bruce Street, Spring Street, and East Street, and at Bay Street at Bruce Street, Spring Street and East Street (note Bay Street and Bruce Street would have a left turn lane for eastbound only).
- Through-left and right turn lane configuration at Queen Street at Huron, Queen Street and Gore Street, and Bay Street and Gore Street.

In addition to the above, further consideration should be given to need for turning lanes at Bay Street and Brock Street, and Bay Street and Dennis Street, as these tend to be busier intersections with higher turning movements (though below thresholds indicated).

4.3 Signal Warrants

Existing traffic signals on Bay and Queen Street were re-evaluated to determine if they are currently justified under Ontario Traffic Manual (OTM) Book 12 using 2017 traffic counts. Signal warrants for the one-way operations are provided in Appendix C. If there are any future developments that would generate a significant amount of trips along Bay or Queen Street, the signal warrant analysis should be re-examined.

Justification 4 – Minimum Four-Hour Volume was used as a basis for recommendations of the current signals with the following guidelines:

- Keep signal – Intersection volumes fulfill 50% or more of Justification 4
- Consult – Intersection volumes fulfill between 40% and 50% of Justification 4
- Remove Signal – Intersection volumes are below 40% of Justification 4

The thresholds were developed to reflect current City conditions, were there was significant public hesitation with regards to removal of signals. The 40% threshold for removal of signals was chosen so that only intersections where there is a very clear opportunity to remove the signal is chosen at the current time. Intersections with the “Consult” recommendation should be investigated further for the need of the existing traffic signal. Exhibit 4-2 summarizes the recommendations for each existing traffic signal on Queen Street East and Bay Street.

Exhibit 4-2: One Way Signal Warrants

Intersection with Existing Signals	Justified by OTM	Recommendation
Bay Street and Gore Street	No	Keep Signal
Bay Street and Dennis Street	No	Consult
Bay Street and Ron Francis Way	No	Keep Signal
Bay Street and Elgin Street	Yes	Keep Signal
Bay Street and Spring Street	No	Remove Signal
Bay Street and Brock Street	No	Keep Signal
Bay Street and East Street	No	Remove Signal
Queen Street and Huron Street	No	Keep Signal
Queen Street and Gore Street	No	Keep Signal
Queen Street and Dennis Street	No	Consult
Queen Street and Bruce Street	No	Keep Signal
Queen Street and Elgin Street	No	Keep Signal
Queen Street and Spring Street	No	Remove Signal
Queen Street and Brock Street	No	Consult
Queen Street and East Street	No	Keep Signal
Queen Street and Pim Street	Yes	Keep Signal

Traffic signals on Queen and Bay Street were also evaluated after two-way conversion. OTM Book 12 Justification 7 was used to determine if the signals would be justified under future two-way traffic volumes. Justification 7 uses Justification 1 and 2 with future road volumes to warrant a signal. Signal warrants for the two-way operations are provided in Appendix D. The following guidelines were used for a recommendation of the current signals:

- Keep signal – Intersection volumes fulfill 50% or more of Justification 7

- Consult – Intersection volumes fulfill between 40% and 50% of Justification 7
- Remove Signal – Intersection volumes are below 40% of Justification 7

Similar to recommendations for one-way signal warrant, the "Consult" recommendation should be investigated further for the need of a traffic signal under two-way operation. Exhibit 4-3 summarizes the recommendations for each existing traffic signal on Queen Street East and Bay Street under two-way operation.

Exhibit 4-3: Two Way Signal Warrants

Intersection	Justified by OTM	Recommendation
Bay Street and Huron Street	No	Consult
Bay Street and Gore Street	No	Keep Signal
Bay Street and Dennis Street	No	Remove Signal
Bay Street and Ron Francis Way	No	Remove Signal
Bay Street and Elgin Street	No	Keep Signal
Bay Street and Spring Street	No	Remove Signal
Bay Street and Brock Street	No	Consult
Bay Street and East Street	No	Remove Signal
Bay Street and Pim Street	No	Remove Signal
Queen Street and Huron Street	No	Keep Signal
Queen Street and Gore Street	No	Consult
Queen Street and Dennis Street	No	Remove Signal
Queen Street and Bruce Street	No	Keep Signal
Queen Street and Elgin Street	No	Keep Signal
Queen Street and Spring Street	No	Consult
Queen Street and Brock Street	No	Consult
Queen Street and East Street	No	Consult
Queen Street and Pim Street	No	Consult

4.4 East Street Conversion

Feedback from the public and business owners included a request to consider conversion of East Street to two-way traffic between Albert Street and Wellington Street. This could provide a more direct path to the downtown for westbound traffic on Wellington Street, which today is required to use Pim Street, or tends to remain on Wellington Street East bypassing the downtown. The northbound to eastbound flow on East Street in the p.m. peak hour at 927vph is likely too high to allow conversion of this segment. A signal would be required at Albert Street and East Street, and right-of-way would need to be expanded to allow a double left turn (eastbound left) at this location. Then two receiving lanes of appropriate width plus a southbound lane would likely require widening of the roadway to provide appropriate receiving lane widths (one lane southbound and two lanes northbound). Alternatively with existing right-of-way and one lane per direction northbound and southbound there would be very poor traffic operations.

5 Conclusions

This report provides an analysis of two-way conversion of downtown streets. The analysis methodology was a screenline-based, volume-to-capacity approach to identify whether alternatives could accommodate forecast traffic volumes. The methodology was supplemented with a more detailed look at existing conditions along Bay Street and Queen Street. Finally, a review of signal warrants was undertaken to identify if any signals could be removed.

Generally the review of existing conditions found that the network operates well in typical a.m. and p.m. peak hours with no individual movements exceeding capacity, and no intersections with long delays requiring multiple cycles for traffic to pass. The analysis did not consider start and end of Greyhound games or other events as they are considered irregular and typically of short duration.

A total of six alternatives were proposed and the following conclusions were made after traffic analysis:

- **Alternative 1 – "Do-Nothing":** This alternative leaves all the streets under one-way operation and reduces Bay Street to three lanes with a Multi-Use Path. The reduction of lanes does not significantly decrease the road network performance.
- **Alternative 1A – Modified Base Scenario:** This alternative is similar to Alternative 1, but reduces Bay Street further to two lanes. Again, the further reduction in lanes does not significantly impact the road network performance.
- **Alternative 2 – Convert all east-west one way streets to two-way operations:** The two-way conversion allows the directional volumes to be distributed between each one-way couplet, which allows the roads to operate with sufficient capacity.
- **Alternative 3 – Convert Bay St, Queen St, and Pim St (south of Queen St) to two-way operation:** Converting the one-way couplets of Bay Street and Queen Street the directional volumes to be distributed between both streets. As a result, the road network still operates with sufficient capacity.
- **Alternative 4 – Convert Bay St and Pim St (south of Queen St) to two-way operation:** Converting only Bay Street to two lanes and two-way traffic operation does not allow its current eastbound traffic to be distributed onto other streets. As a result, Bay Street becomes over capacity in the eastbound direction during the PM peak hour. This would result in poor traffic operations and diversion of traffic to Albert Street.
- **Alternative 5 – Convert Queen St to two-way operation:** Similar to Alternative 4, converting only Queen Street would result in traffic volumes approaching capacity and some localized poor traffic operations.

Overall the analysis identified that most alternatives would work well, however converting only Bay Street or only Queen Street from one-way to two-way traffic would result in some localised traffic constraints. Therefore, from a traffic perspective, converting Bay Street and Queen Street together would be a preferred option, if either of them were to be converted.

The existing traffic signals on Queen and Bay Street were checked for warrants using OTM Book 12 under current one-way and two-way operation to justify signal removal. Under current one-way operations, three intersections are good candidates for removal of signals: Bay Street at Spring Street, Bay Street at East Street, and Queen Street at Spring Street.

Appendix A – Turning Movement Counts

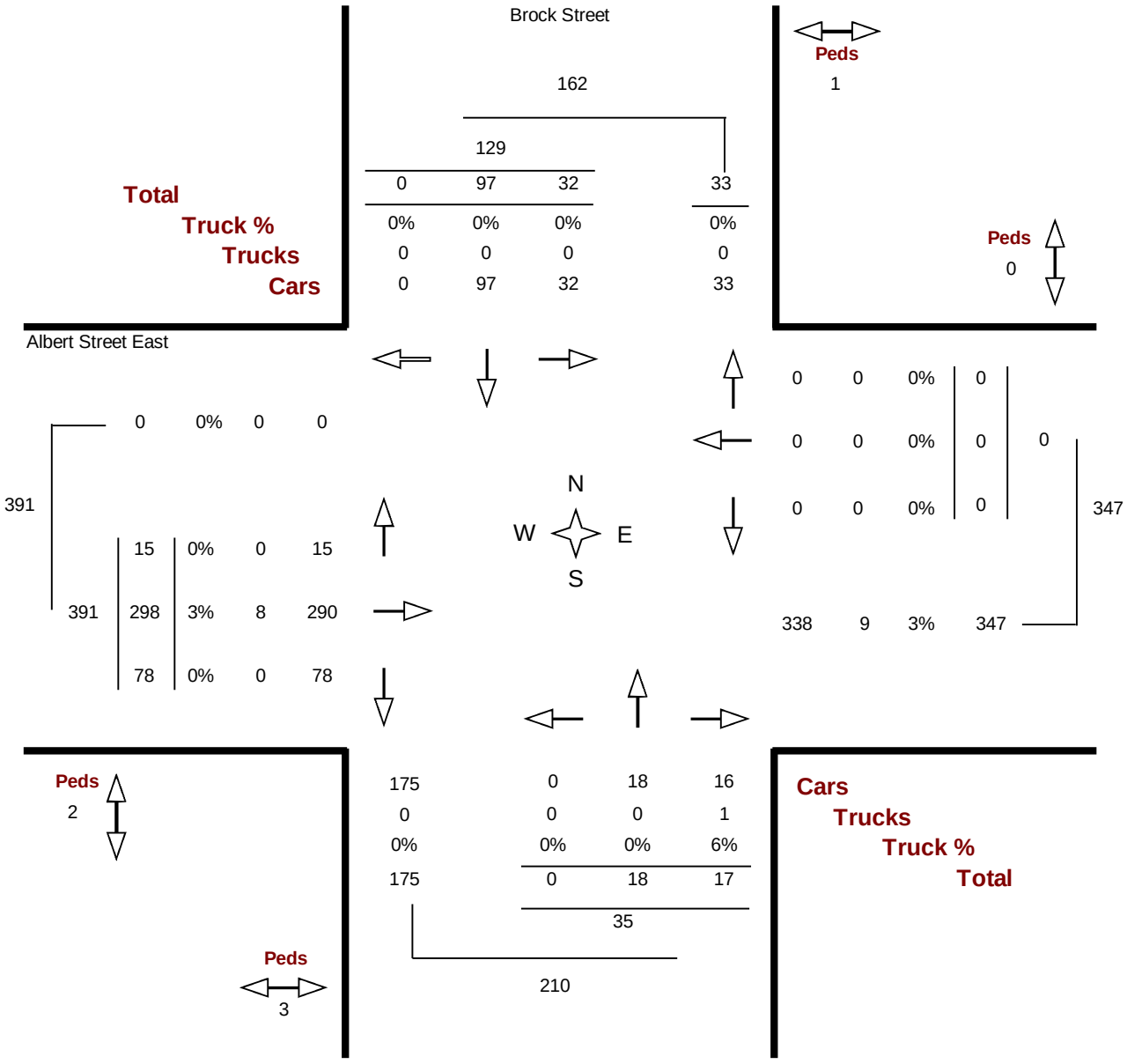
Turning Movements Report - AM Period

Location..... Albert Street East @ Brock Street

Municipality..... Sault Ste. Marie

GeoID..... 7041

Count Date..... Tuesday, 28 November, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



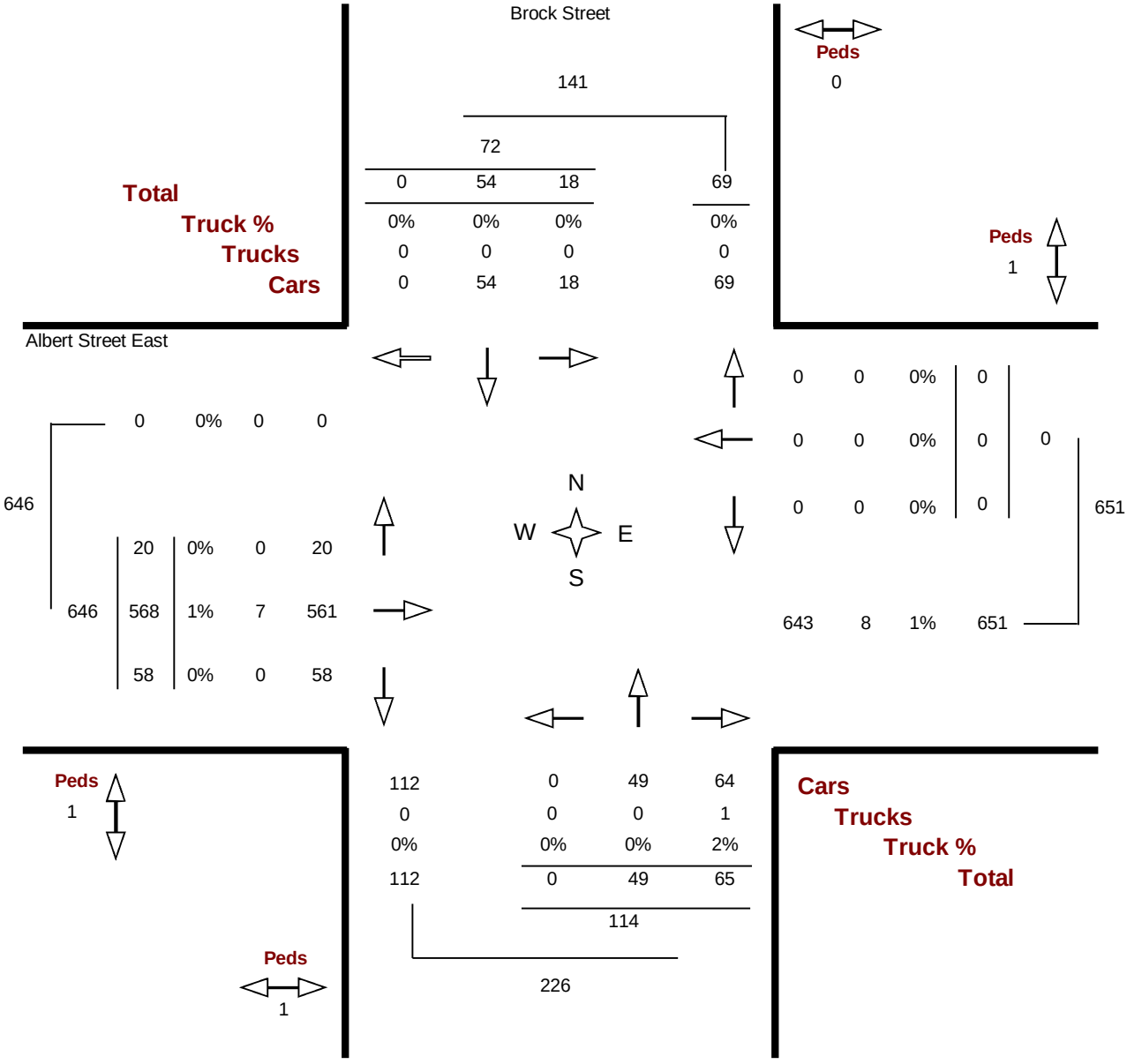
Turning Movements Report - PM Period

Location..... Albert Street East @ Brock Street

Municipality..... Sault Ste. Marie

GeoID..... 7041

Count Date..... Tuesday, 28 November, 2017 **Peak Hour.....** 04:00 PM — 05:00 PM



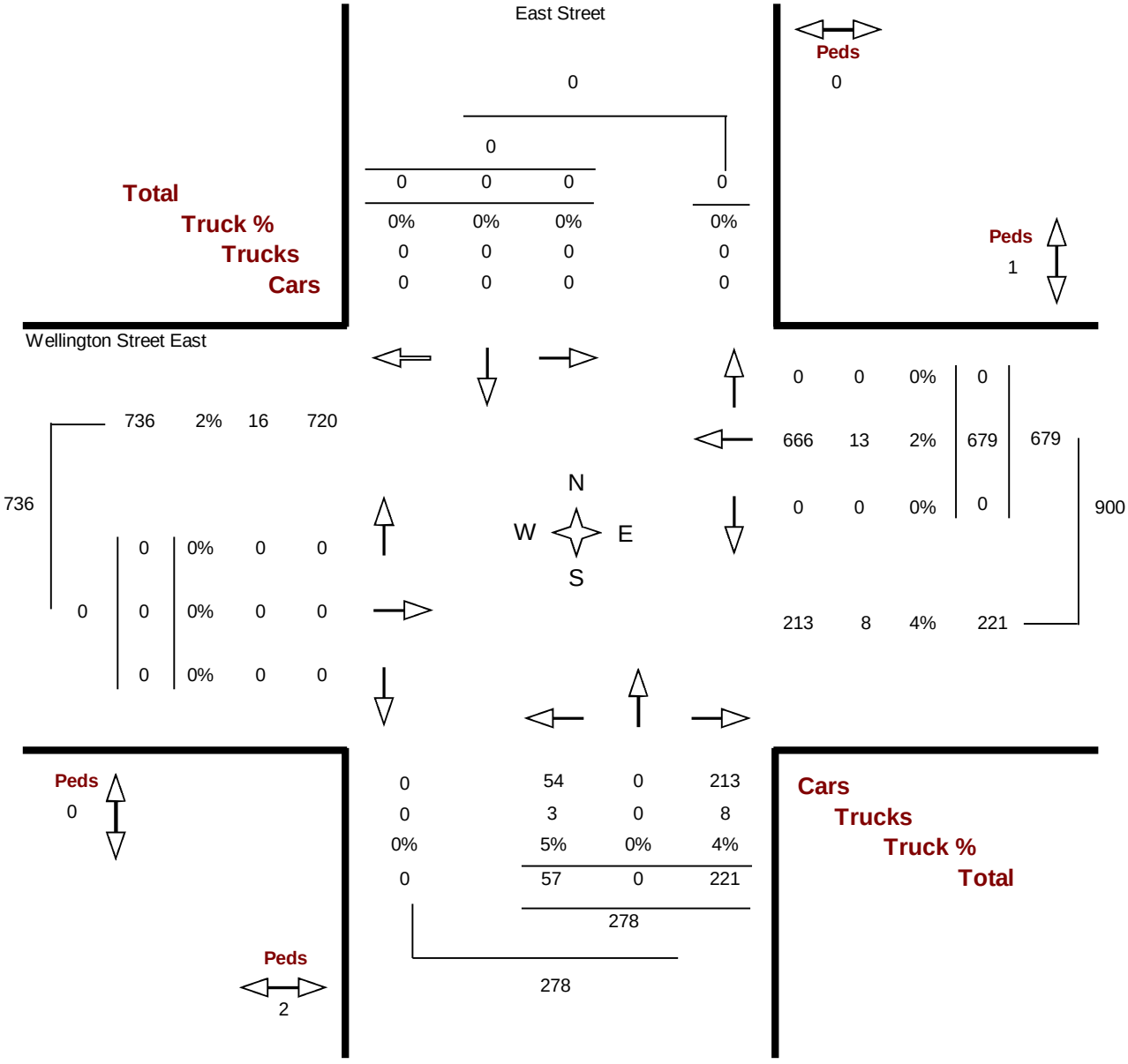
Turning Movements Report - AM Period

Location..... East Street @ Wellington Street East

Municipality..... Sault Ste. Marie

GeoID..... 11206

Count Date..... Tuesday, 05 December, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



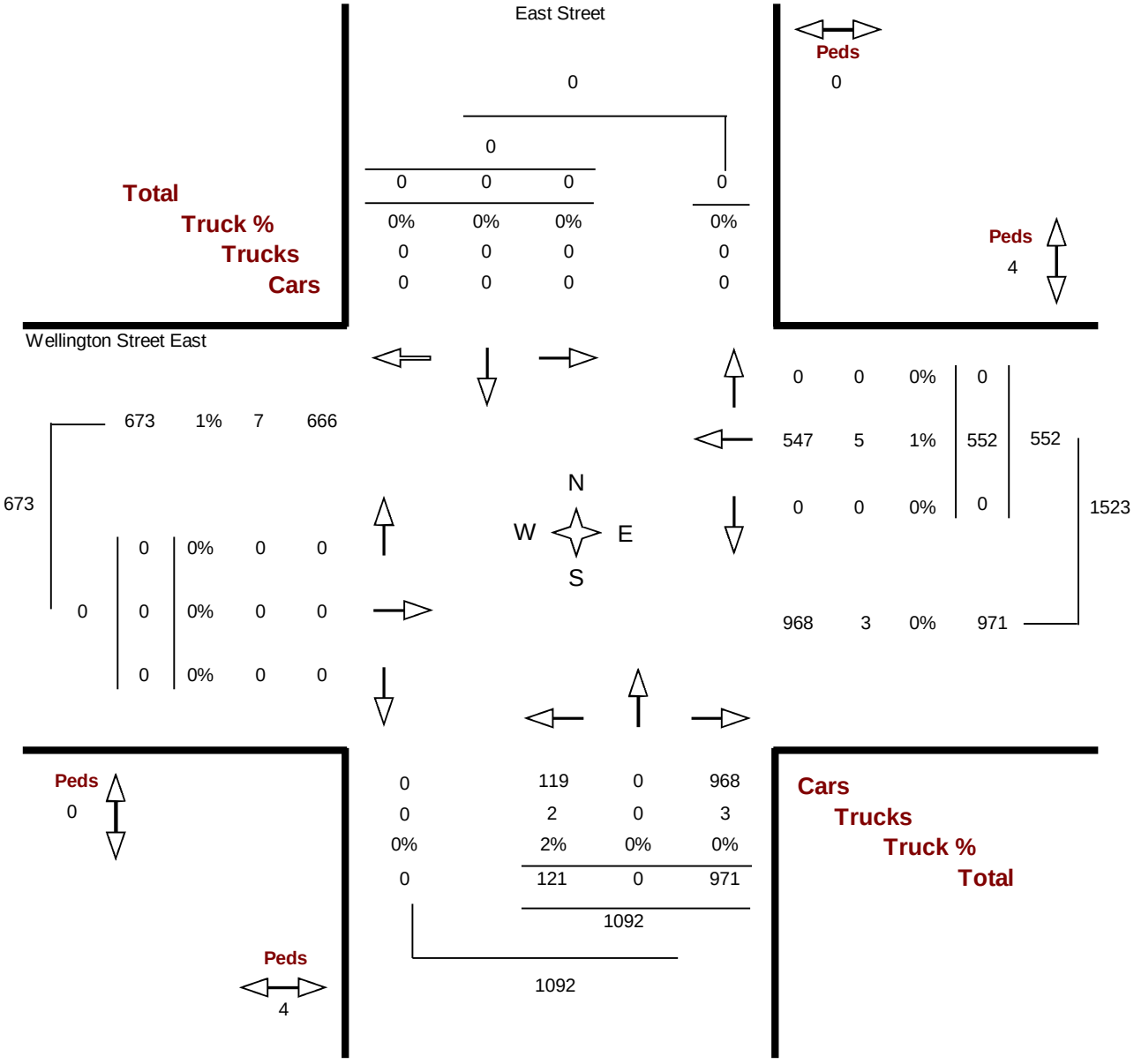
Turning Movements Report - PM Period

Location..... East Street @ Wellington Street East

Municipality..... Sault Ste. Marie

GeoID..... 11206

Count Date..... Tuesday, 05 December, 2017 **Peak Hour.....** 04:15 PM — 05:15 PM



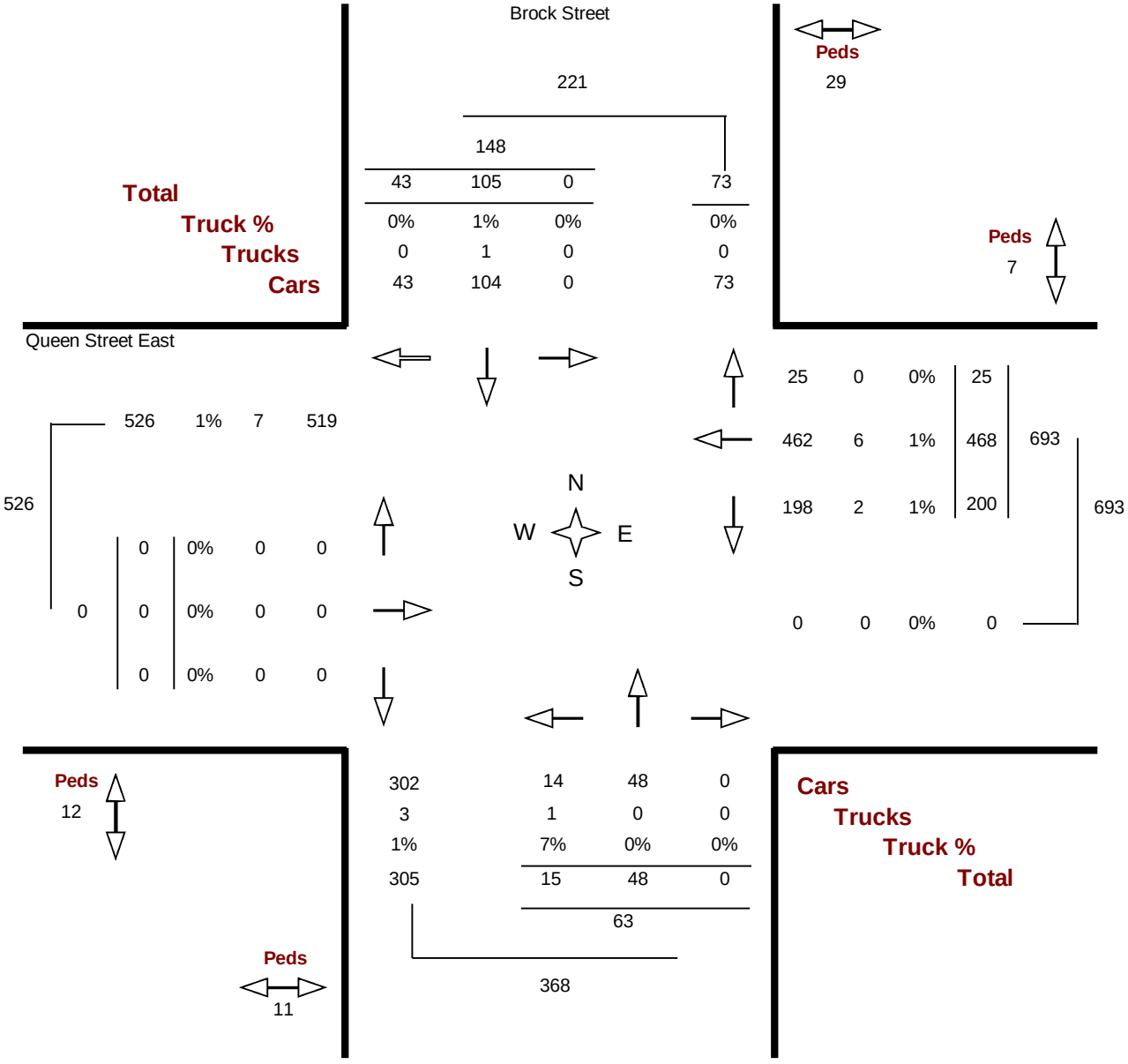
Turning Movements Report - AM Period

Location..... Brock Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 16654

Count Date..... Tuesday, 15 August, 2017 **Peak Hour.....** 08:15 AM — 09:15 AM



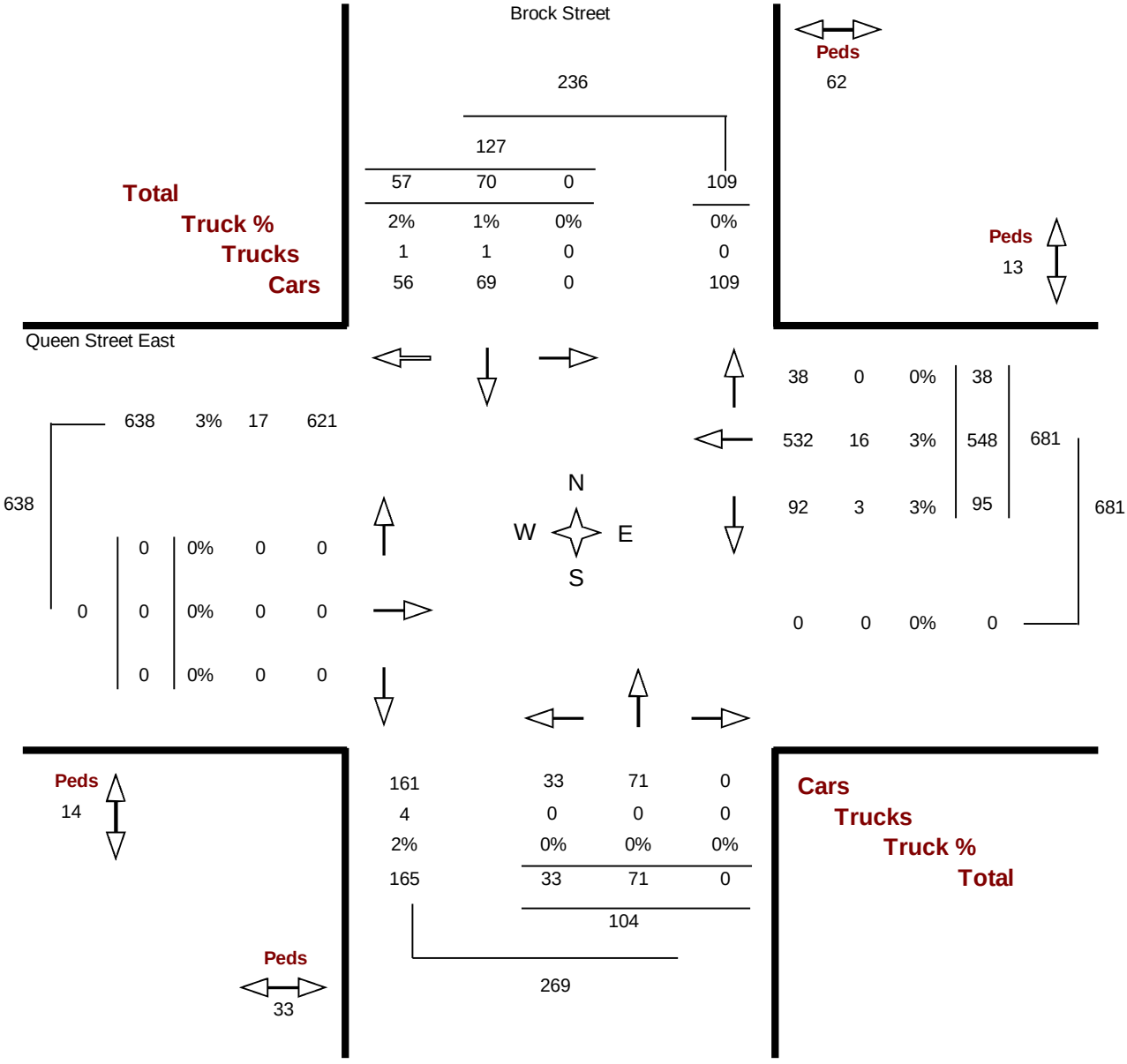
Turning Movements Report - PM Period

Location..... Brock Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 16654

Count Date..... Tuesday, 15 August, 2017 **Peak Hour.....** 03:45 PM — 04:45 PM



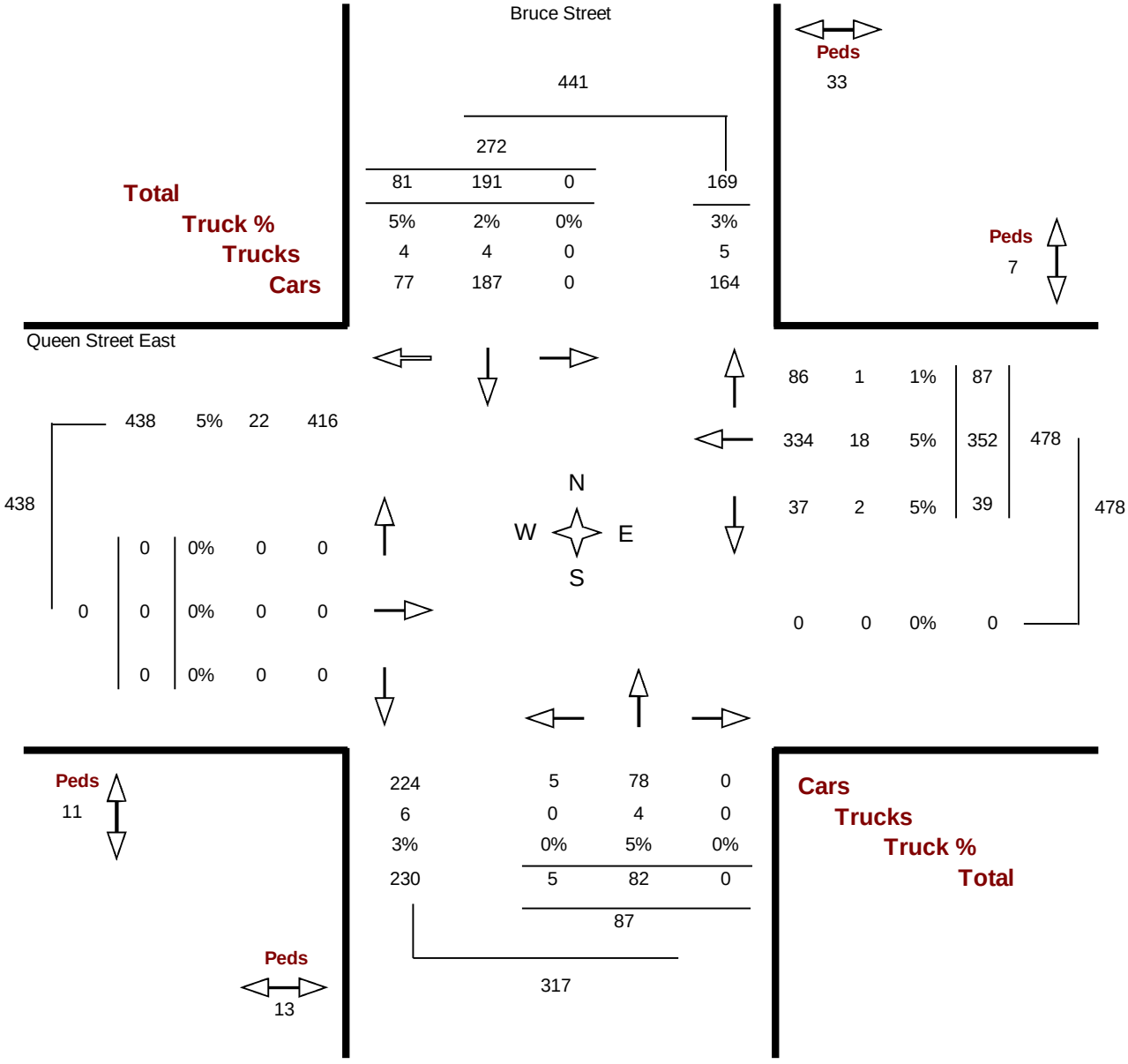
Turning Movements Report - AM Period

Location..... Bruce Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 13778

Count Date..... Wednesday, 23 August, 2017 **Peak Hour.....** 10:00 AM — 11:00 AM



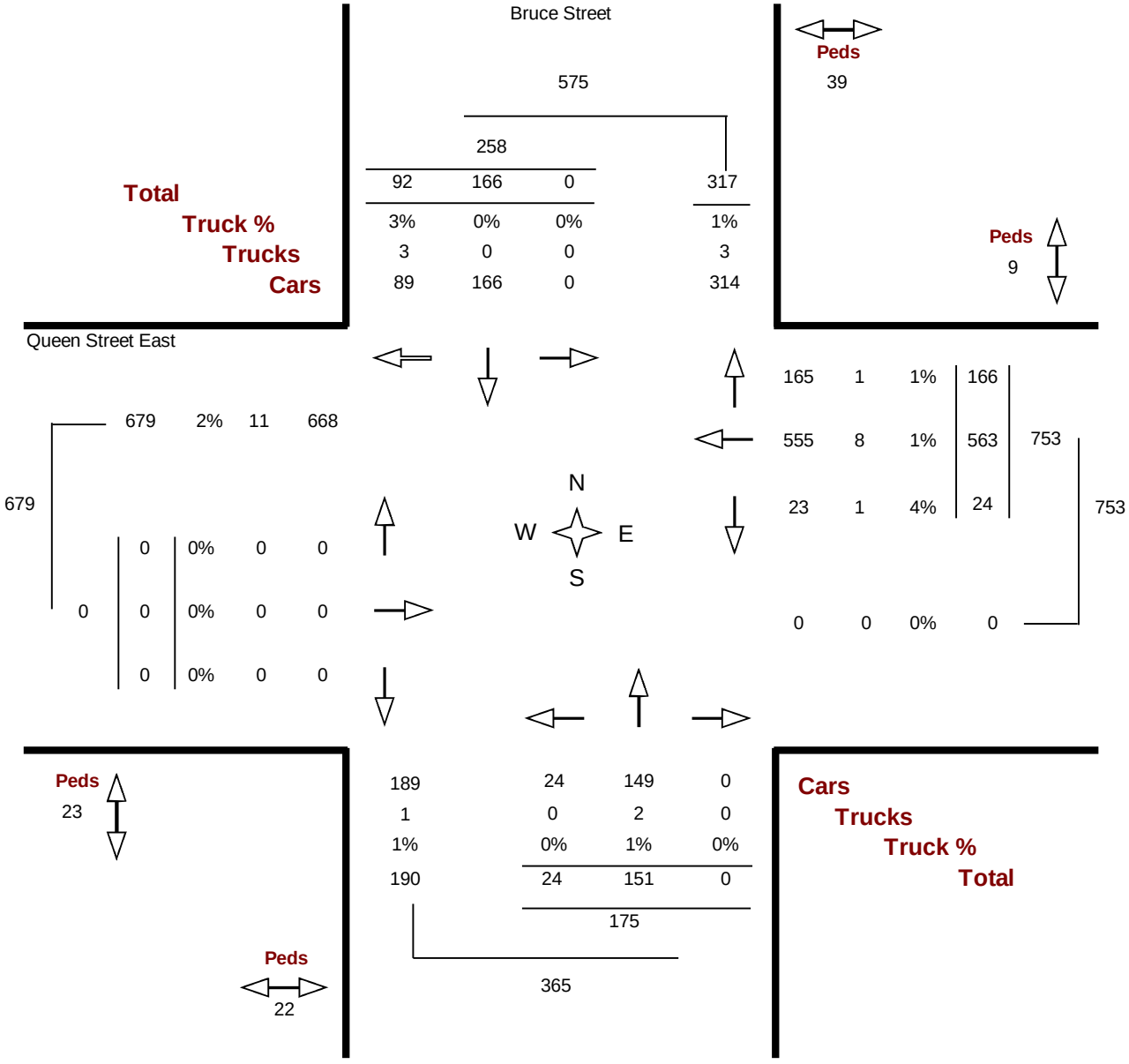
Turning Movements Report - PM Period

Location..... Bruce Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 13778

Count Date..... Wednesday, 23 August, 2017 **Peak Hour.....** 04:15 PM — 05:15 PM



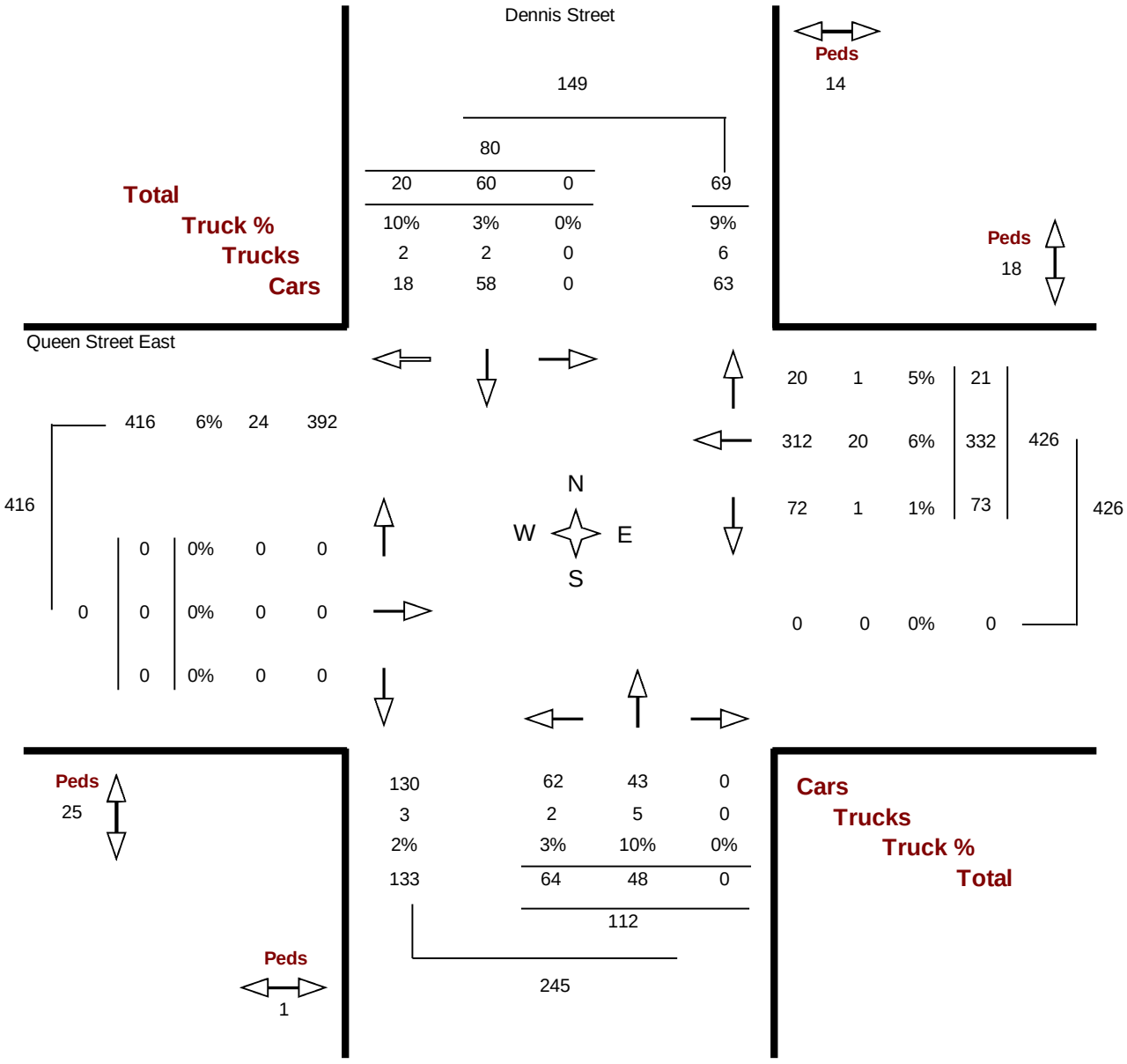
Turning Movements Report - AM Period

Location..... Dennis Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 10566

Count Date..... Wednesday, 23 August, 2017 **Peak Hour.....** 10:00 AM — 11:00 AM



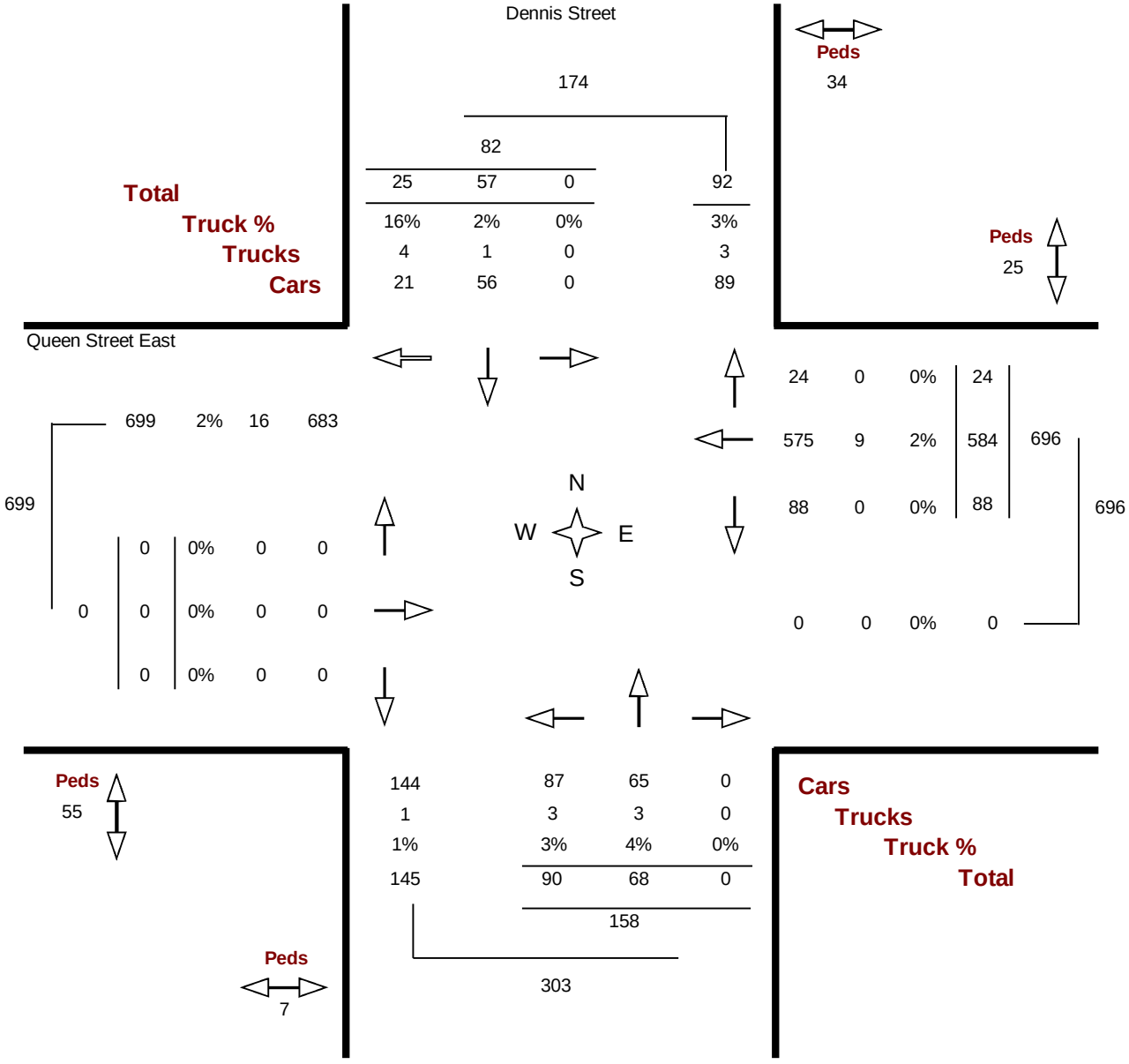
Turning Movements Report - PM Period

Location..... Dennis Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 10566

Count Date..... Wednesday, 23 August, 2017 **Peak Hour.....** 04:15 PM — 05:15 PM



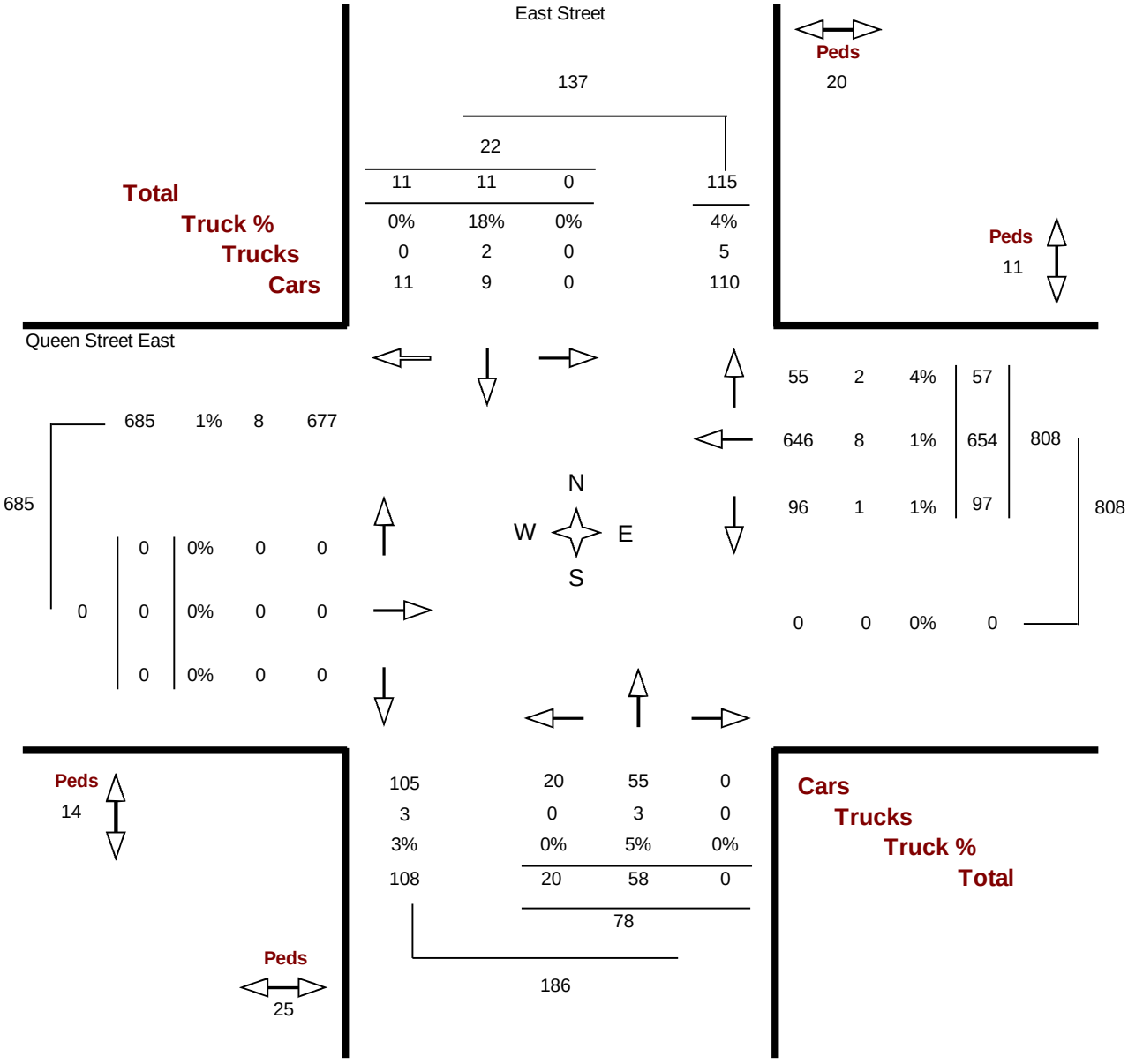
Turning Movements Report - AM Period

Location..... East Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 3867

Count Date..... Tuesday, 15 August, 2017 **Peak Hour.....** 08:15 AM — 09:15 AM



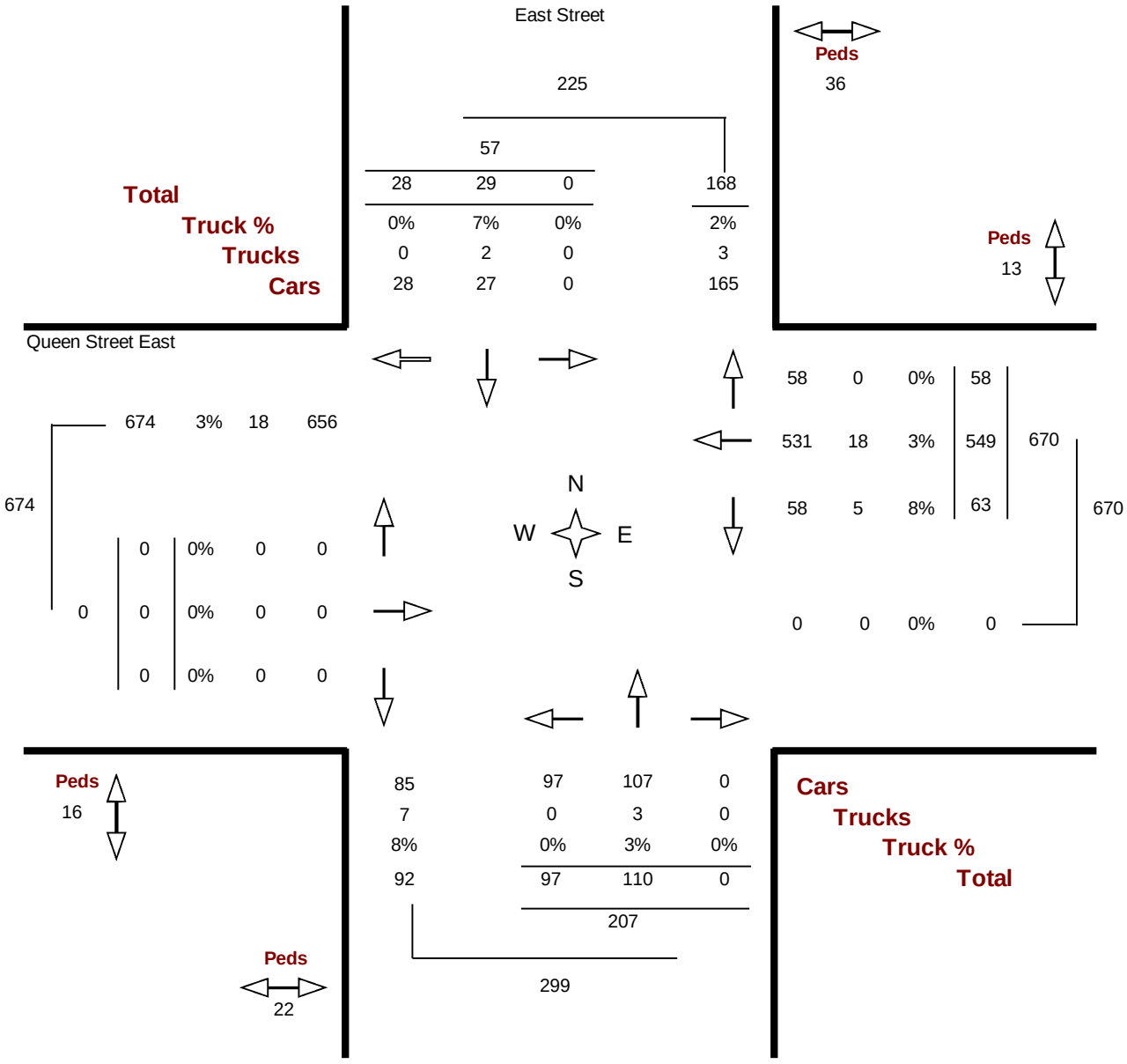
Turning Movements Report - PM Period

Location..... East Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 3867

Count Date..... Tuesday, 15 August, 2017 **Peak Hour.....** 03:45 PM — 04:45 PM



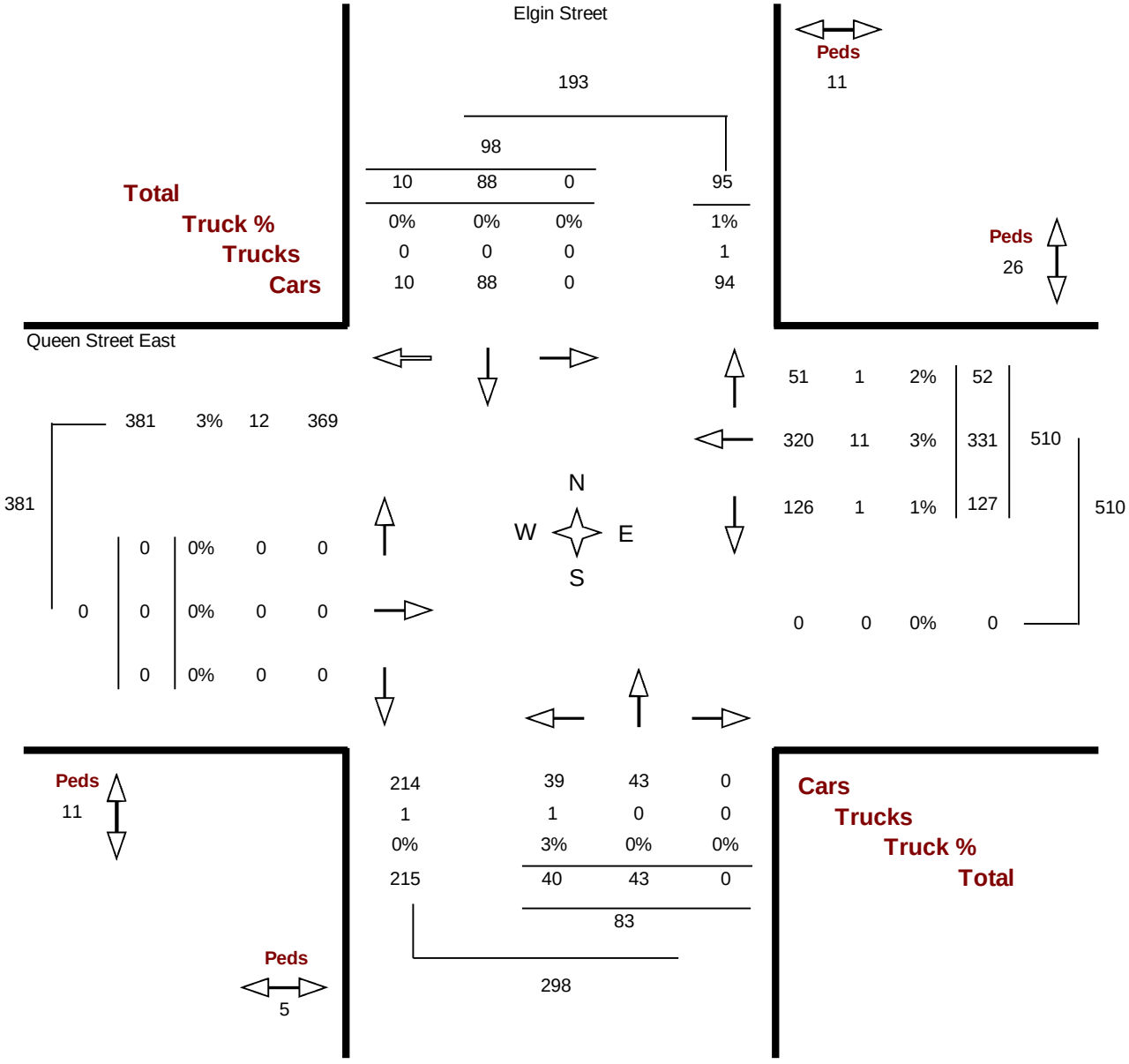
Turning Movements Report - AM Period

Location..... Elgin Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 9607

Count Date..... Thursday, 17 August, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



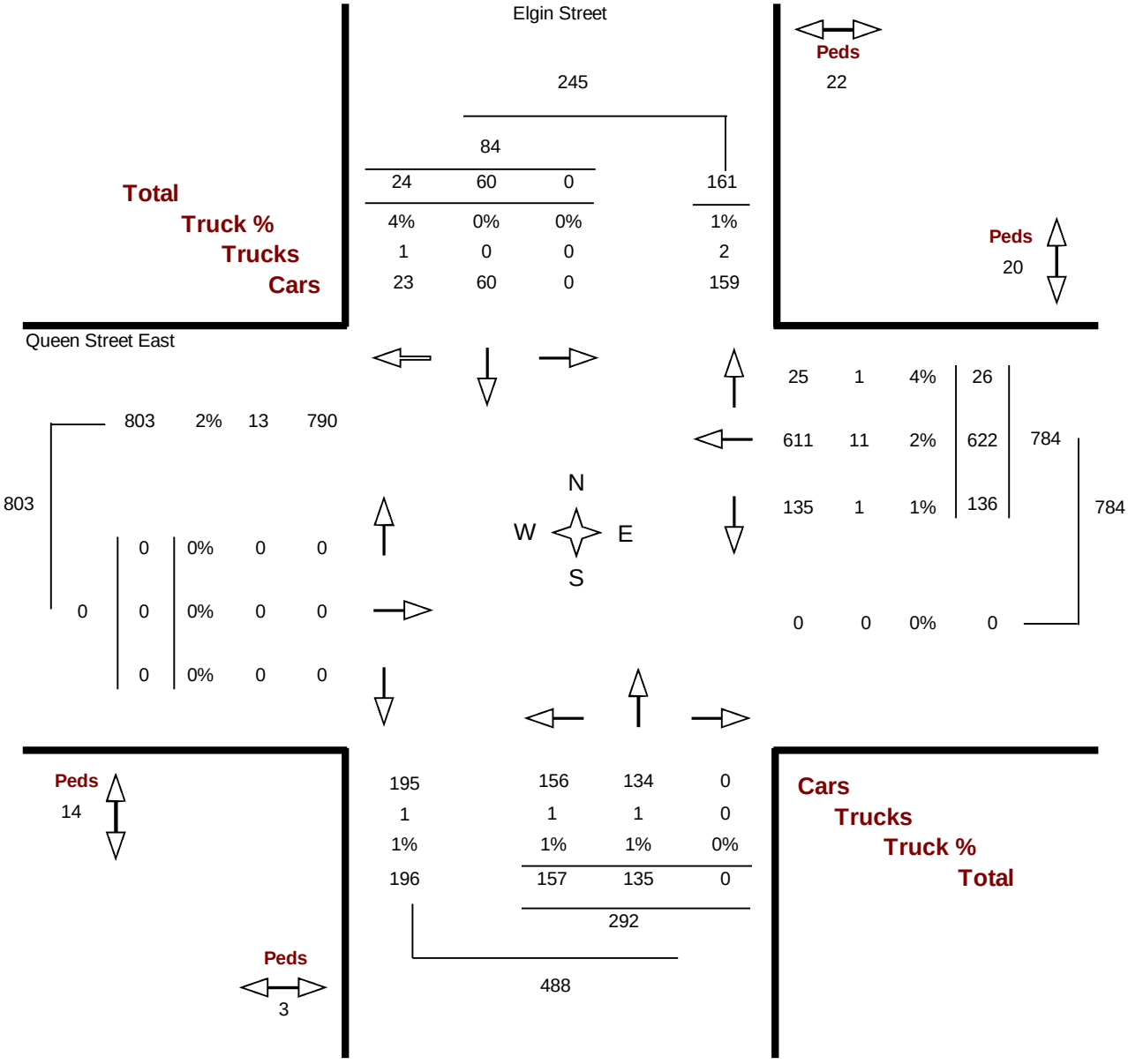
Turning Movements Report - PM Period

Location..... Elgin Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 9607

Count Date..... Thursday, 17 August, 2017 **Peak Hour.....** 04:15 PM — 05:15 PM



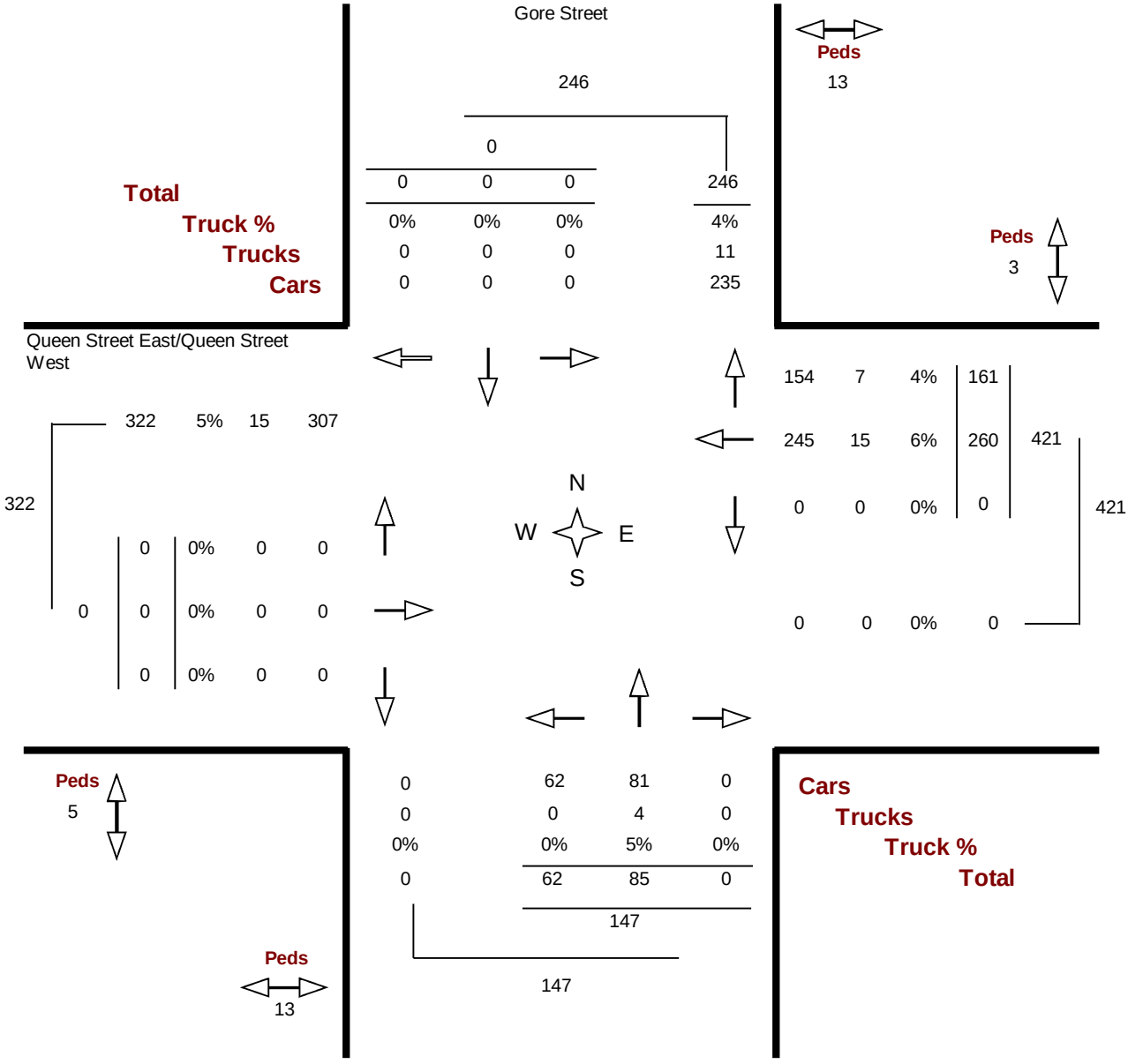
Turning Movements Report - AM Period

Location..... Gore Street @ Queen Street East/Queen Street West

Municipality..... Sault Ste. Marie

GeoID..... 11224

Count Date..... Tuesday, 29 August, 2017 **Peak Hour.....** 10:00 AM — 11:00 AM



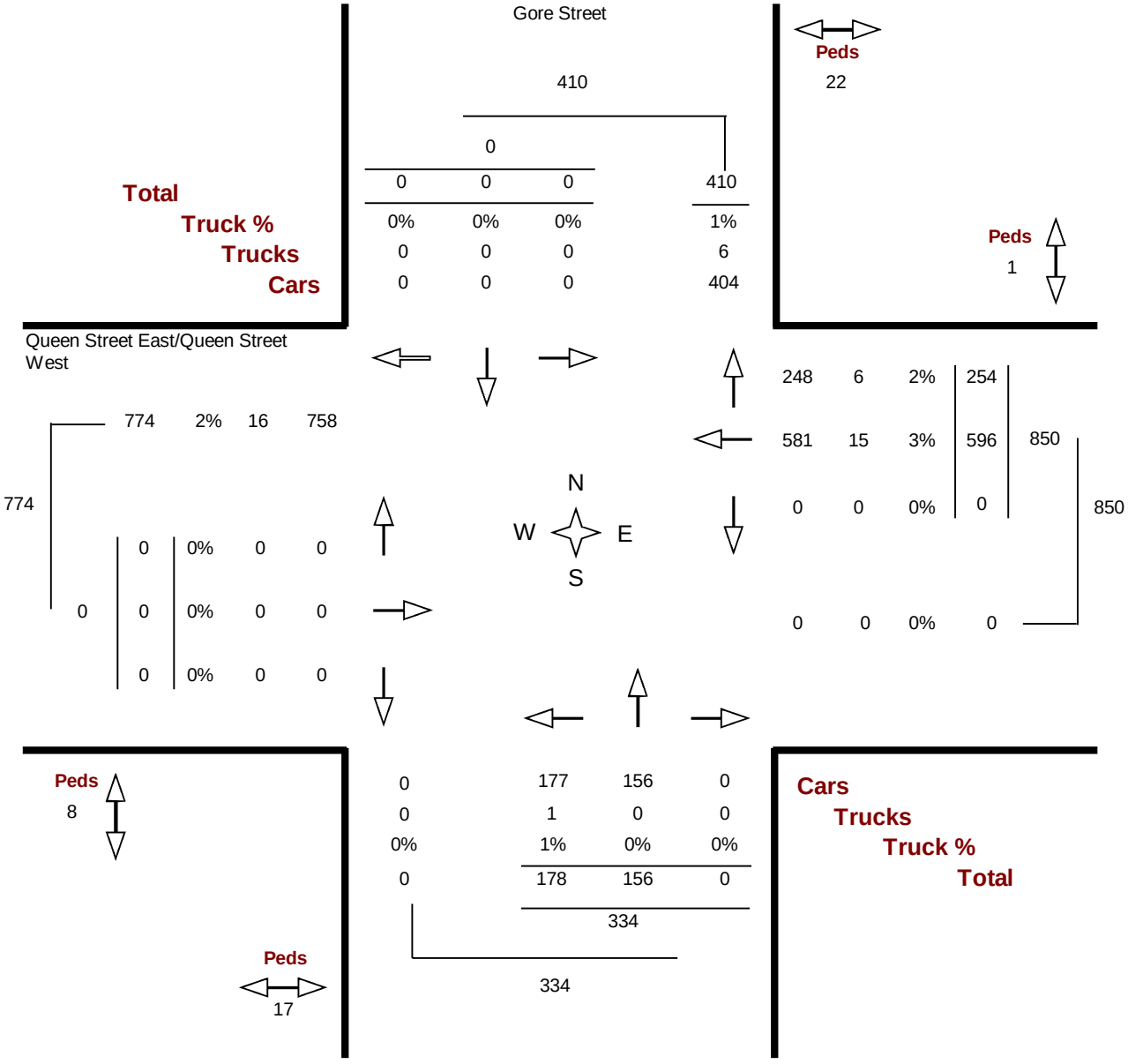
Turning Movements Report - PM Period

Location..... Gore Street @ Queen Street East/Queen Street West

Municipality..... Sault Ste. Marie

GeoID..... 11224

Count Date..... Tuesday, 29 August, 2017 **Peak Hour.....** 04:15 PM — 05:15 PM



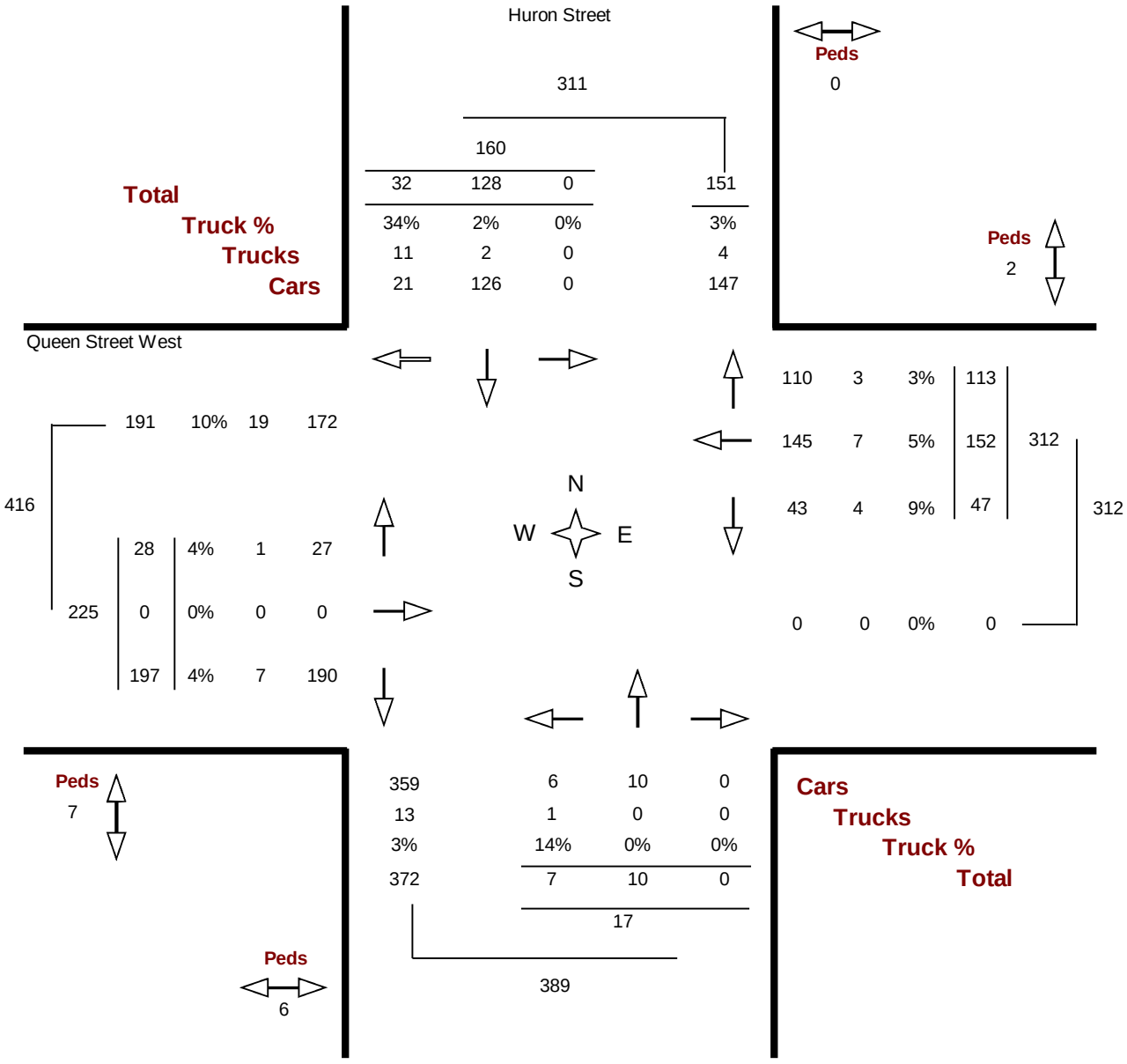
Turning Movements Report - AM Period

Location..... Huron Street @ Queen Street West

Municipality..... Sault Ste. Marie

GeoID..... 2911

Count Date..... Wednesday, 20 September, 2017 **Peak Hour.....** 10:00 AM — 11:00 AM



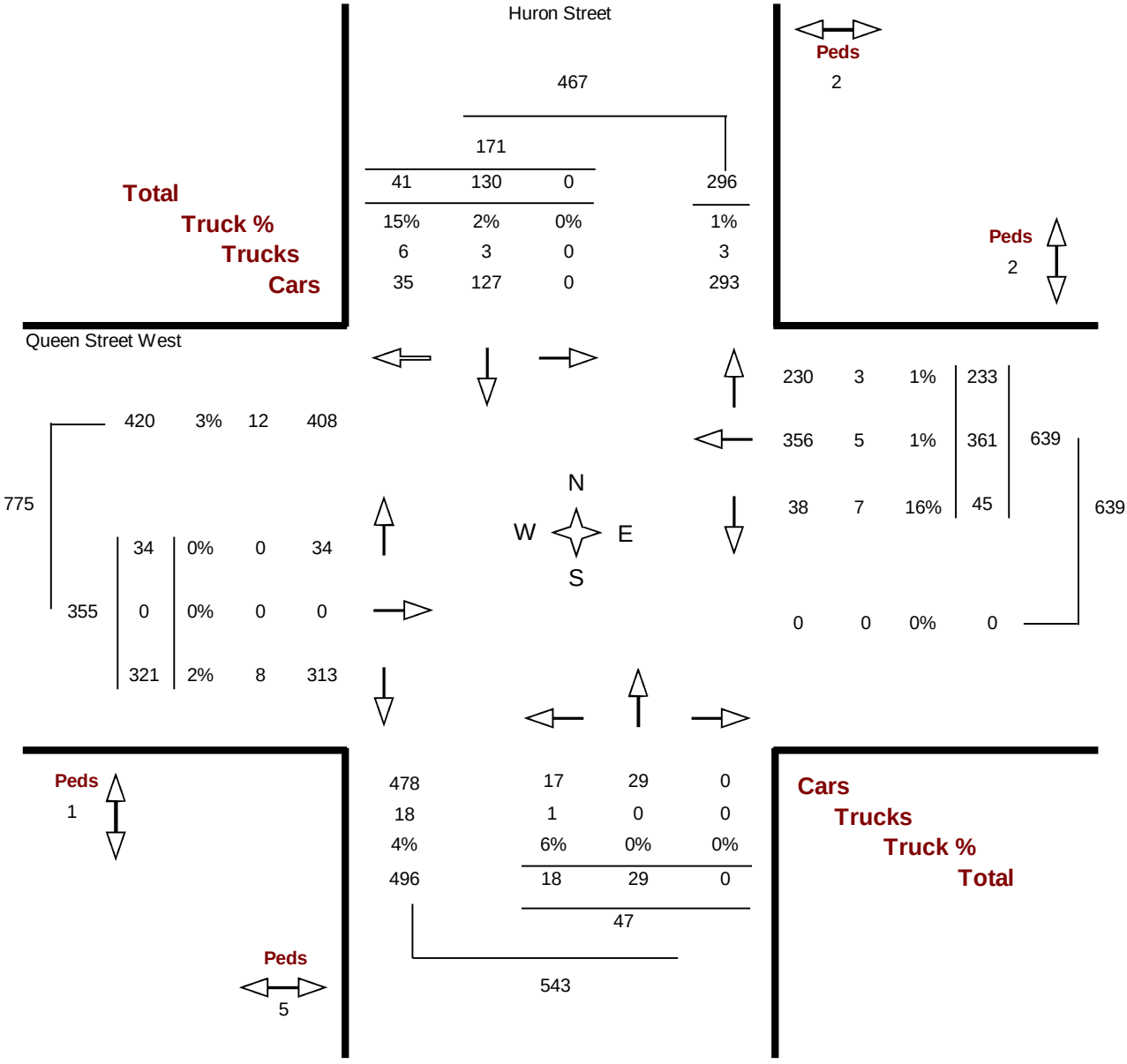
Turning Movements Report - PM Period

Location..... Huron Street @ Queen Street West

Municipality..... Sault Ste. Marie

GeoID..... 2911

Count Date..... Wednesday, 20 September, 2017 **Peak Hour.....** 04:15 PM — 05:15 PM



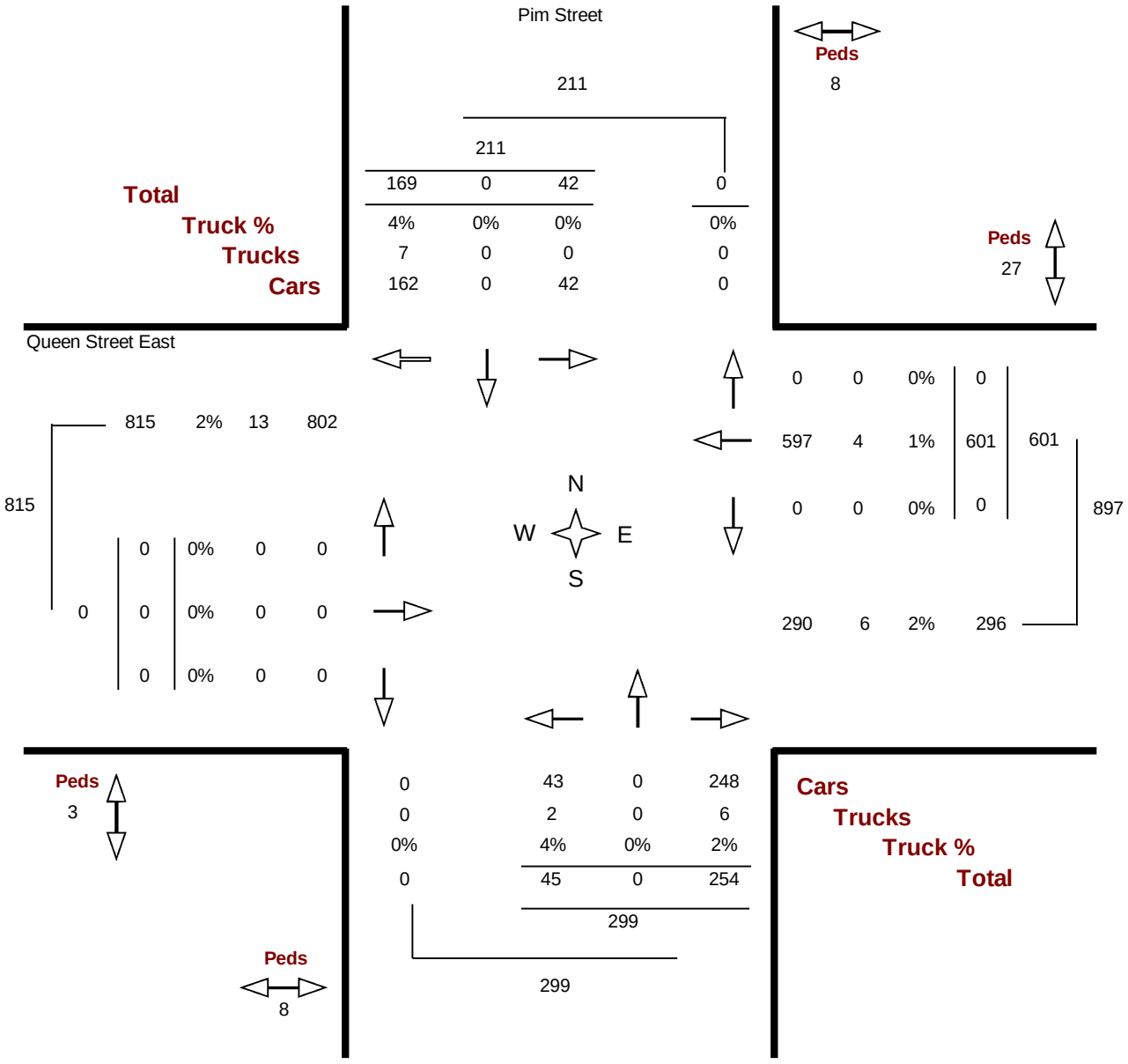
Turning Movements Report - AM Period

Location..... Pim Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 6733

Count Date..... Wednesday, 09 August, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



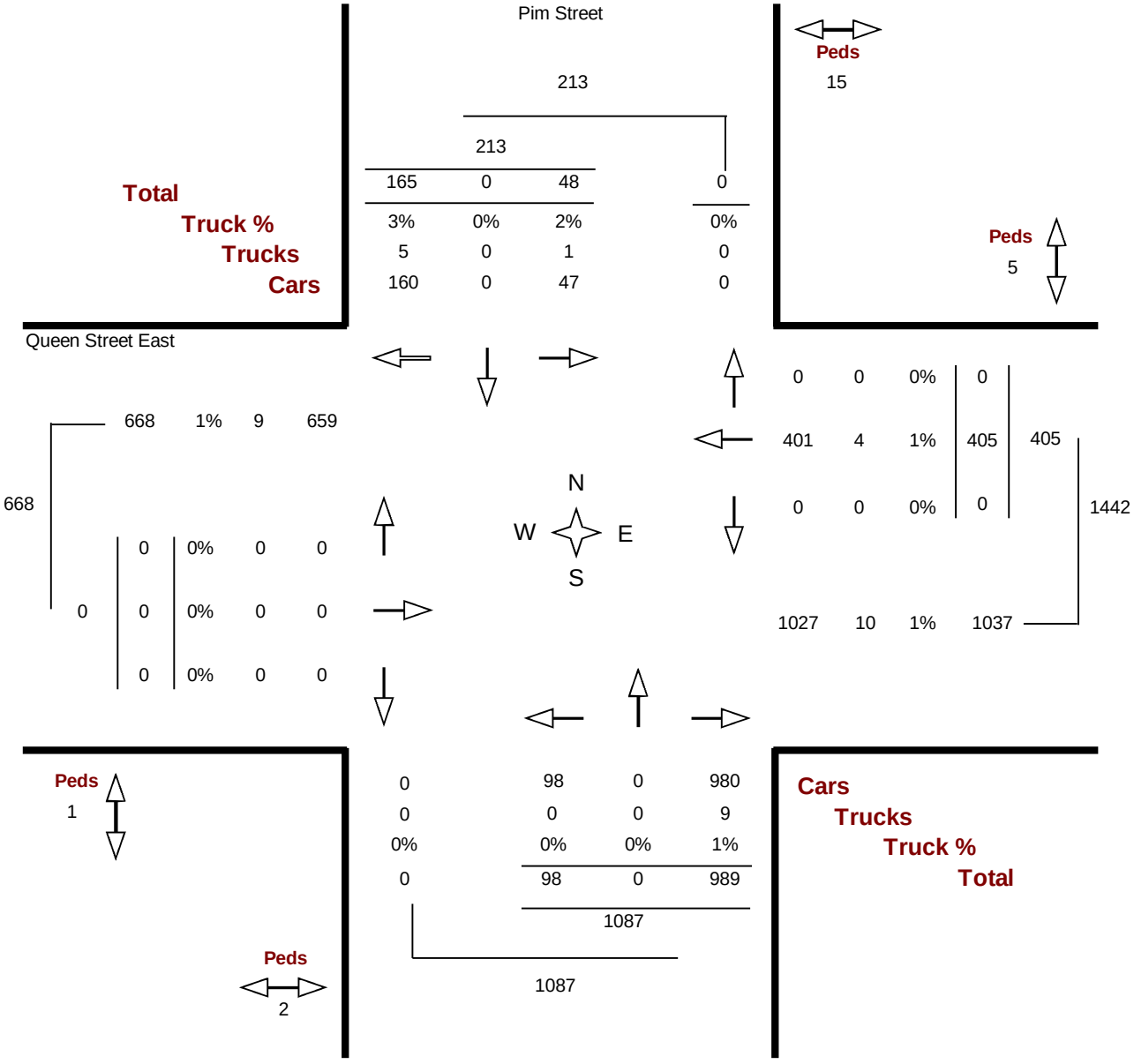
Turning Movements Report - PM Period

Location..... Pim Street @ Queen Street East

Municipality..... Sault Ste. Marie

GeoID..... 6733

Count Date..... Wednesday, 09 August, 2017 **Peak Hour.....** 04:00 PM — 05:00 PM



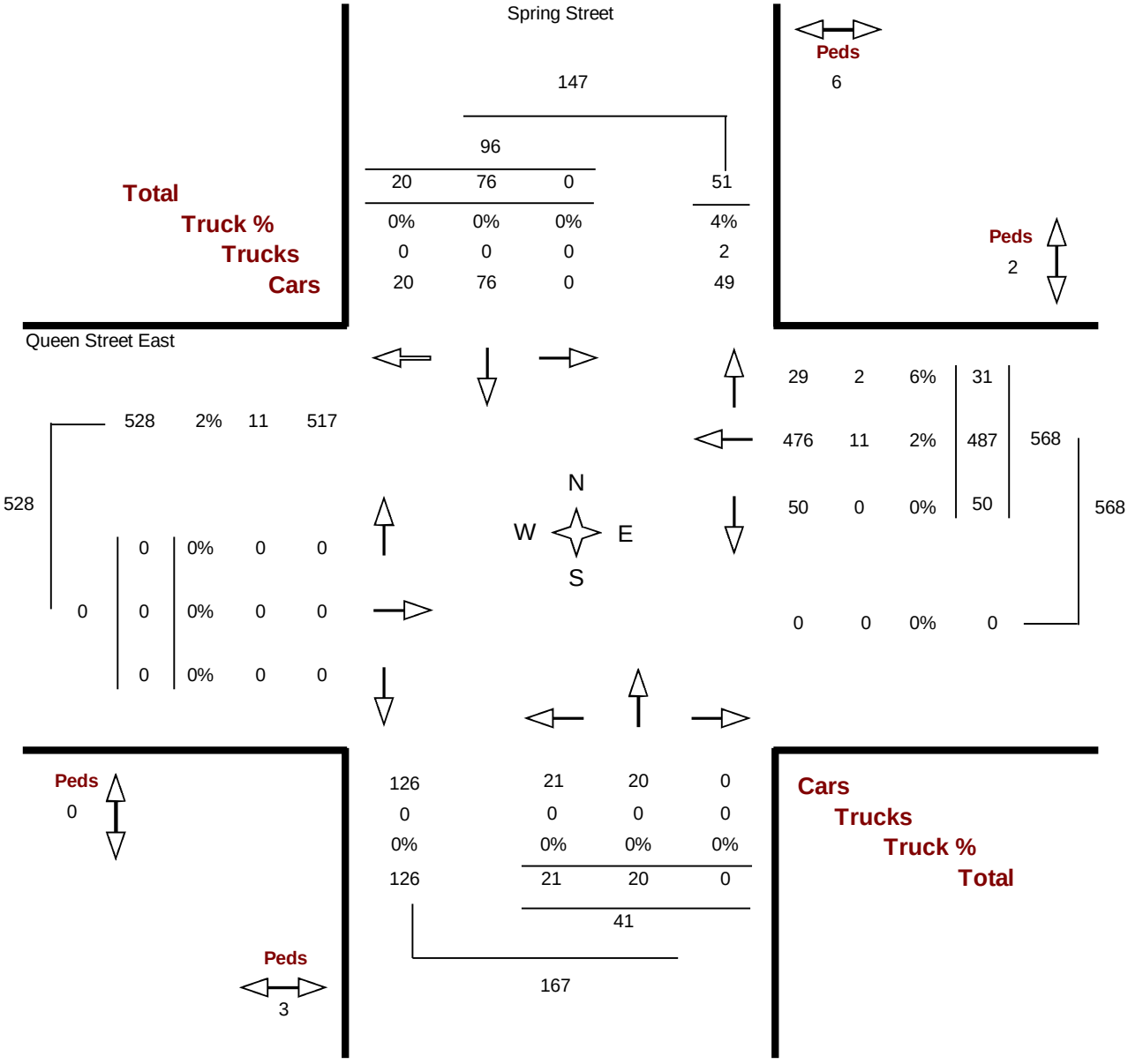
Turning Movements Report - AM Period

Location..... Queen Street East @ Spring Street

Municipality..... Sault Ste. Marie

GeoID..... 11552

Count Date..... Thursday, 17 August, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



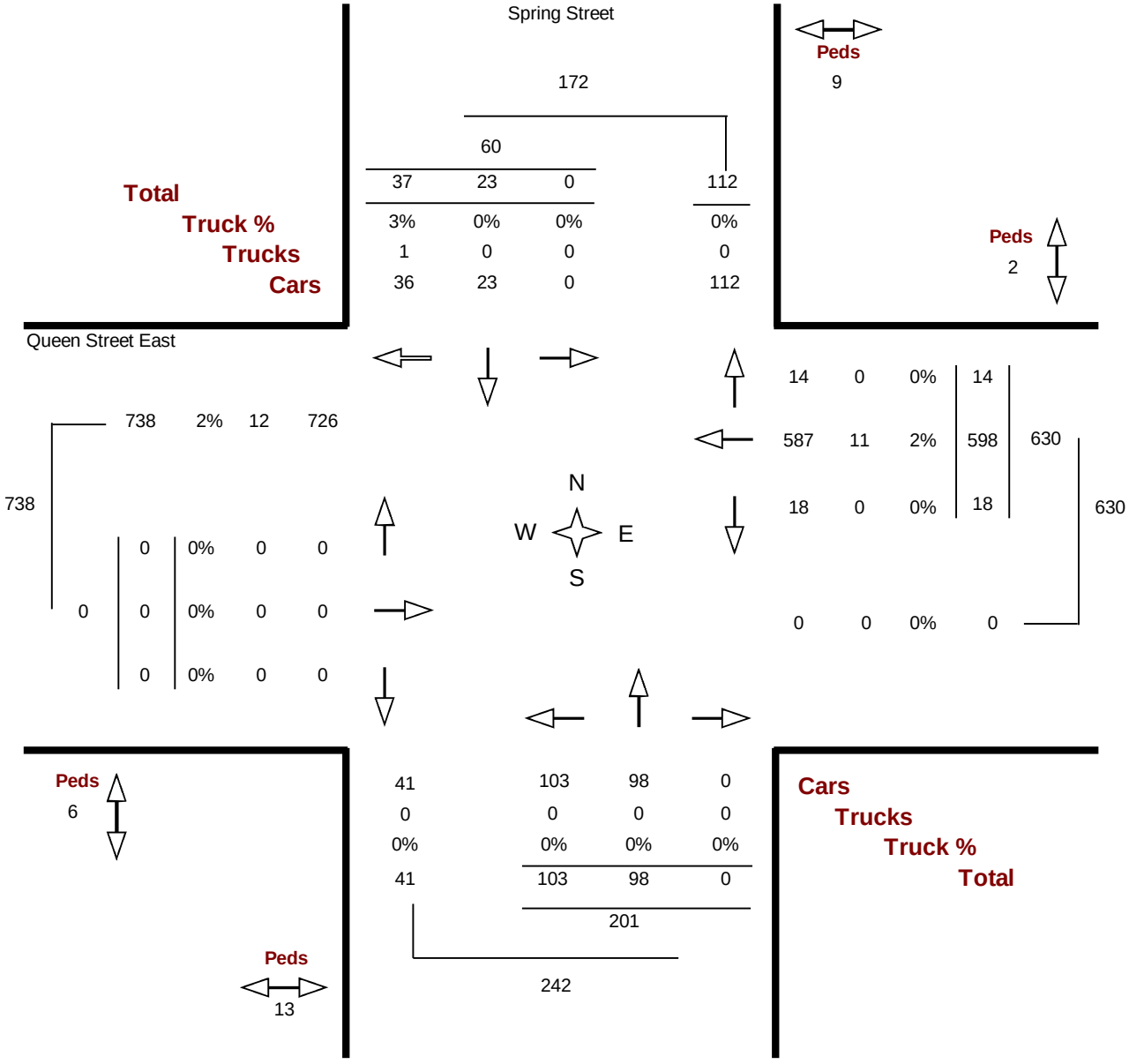
Turning Movements Report - PM Period

Location..... Queen Street East @ Spring Street

Municipality..... Sault Ste. Marie

GeoID..... 11552

Count Date..... Thursday, 17 August, 2017 **Peak Hour.....** 04:15 PM — 05:15 PM



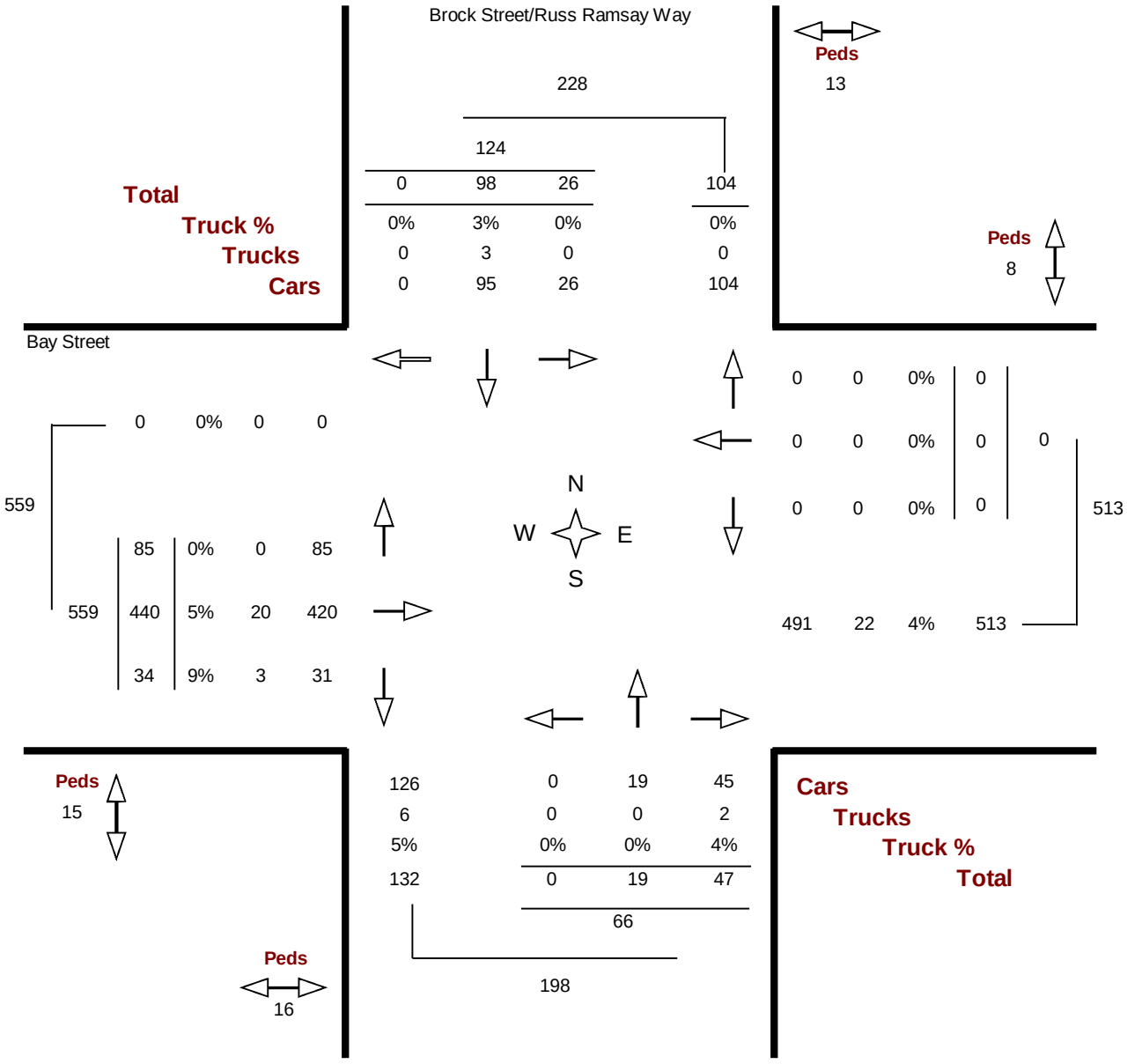
Turning Movements Report - AM Period

Location..... Bay Street @ Brock Street/Russ Ramsay Way

Municipality..... Sault Ste. Marie

GeoID..... 6408

Count Date..... Wednesday, 01 November, 2017 **Peak Hour.....** 10:00 AM — 11:00 AM



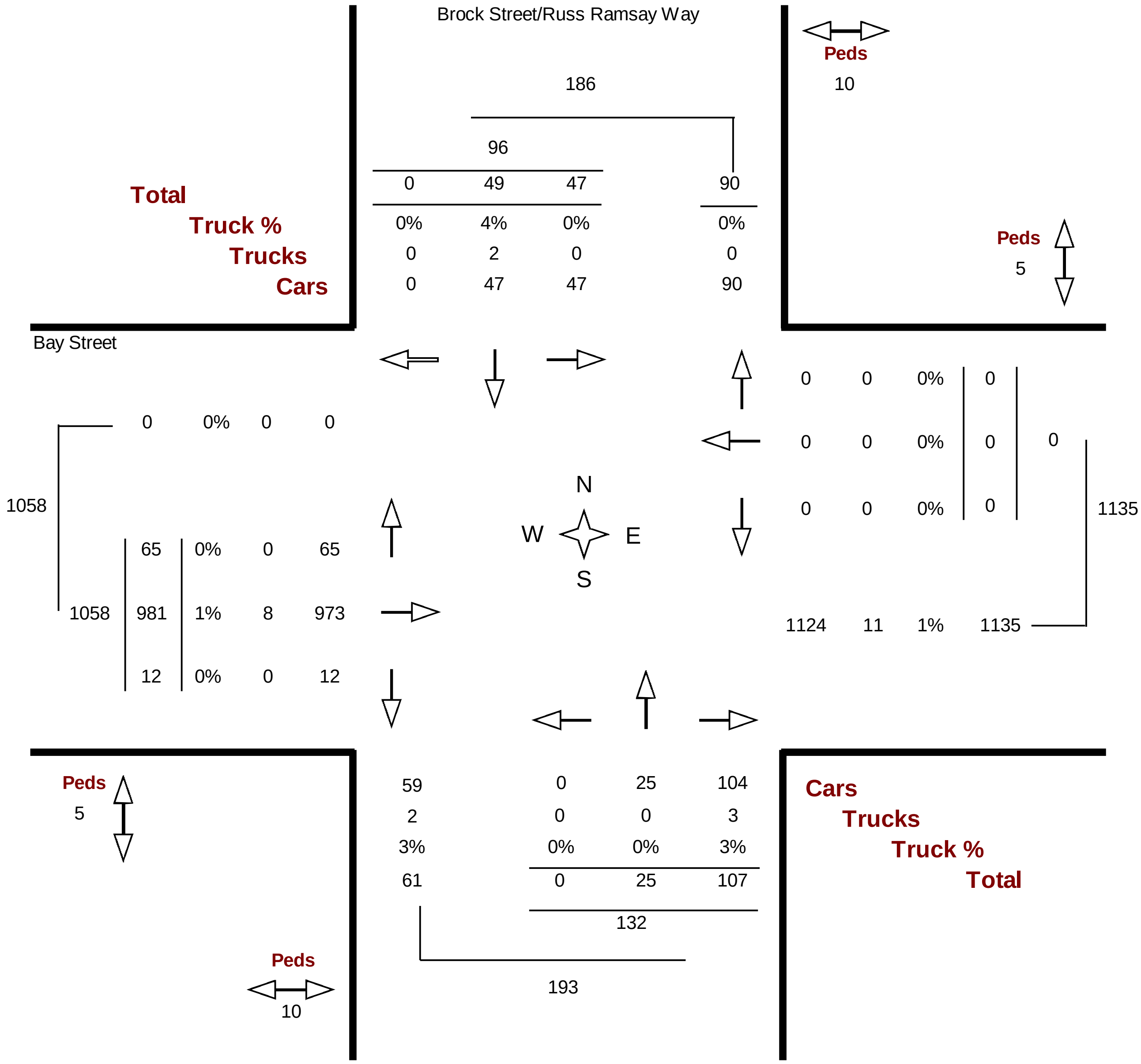
Turning Movements Report - PM Period

Location............. Bay Street @ Brock Street/Russ Ramsay Way

Municipality....... Sault Ste. Marie

GeoID....... 6408

Count Date....... Wednesday, 01 November, 2017 **Peak Hour......** 04:15 PM — 05:15 PM



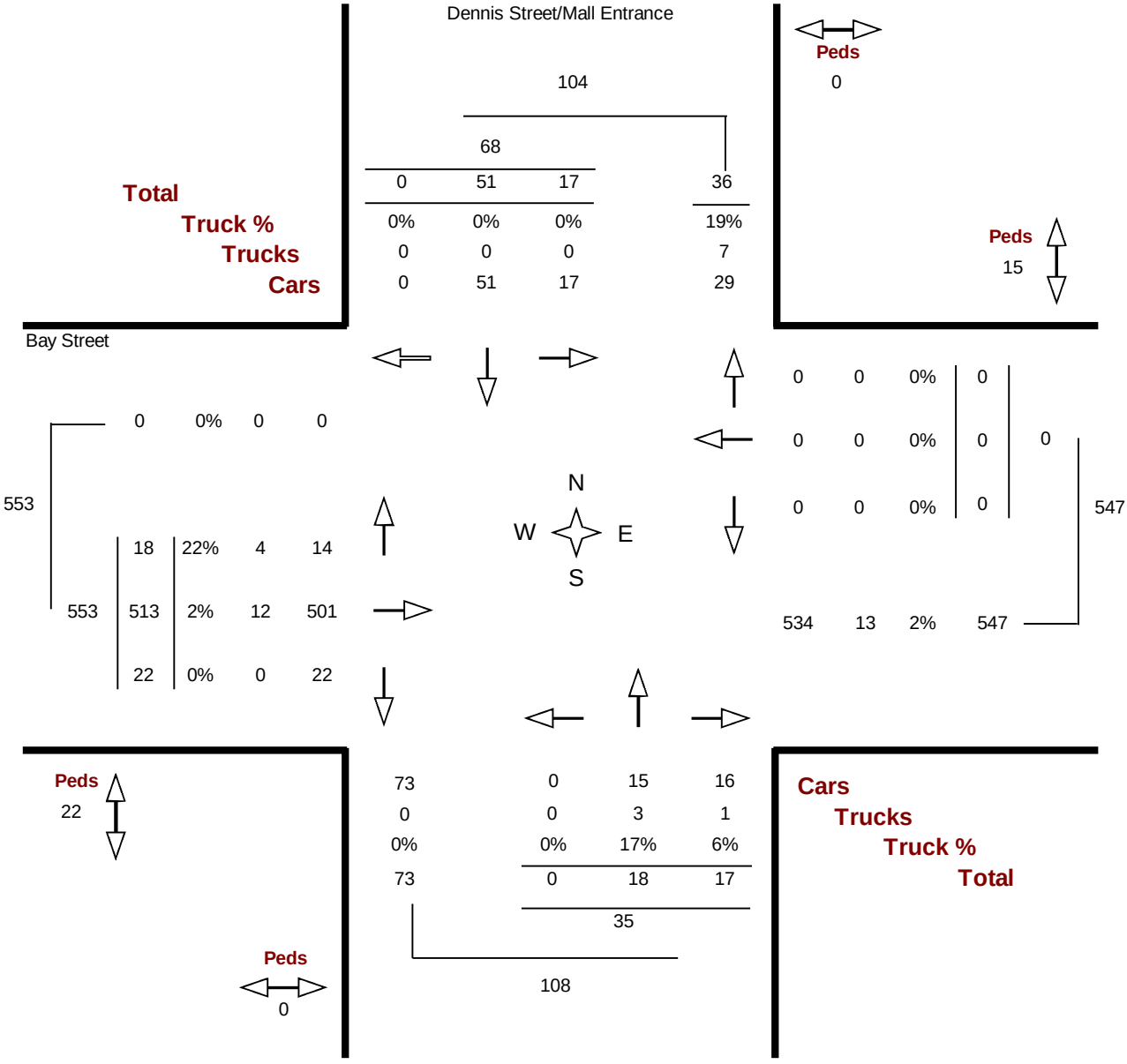
Turning Movements Report - AM Period

Location..... Bay Street @ Dennis Street/Mall Entrance

Municipality..... Sault Ste. Marie

GeoID..... 3251

Count Date..... Thursday, 12 October, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



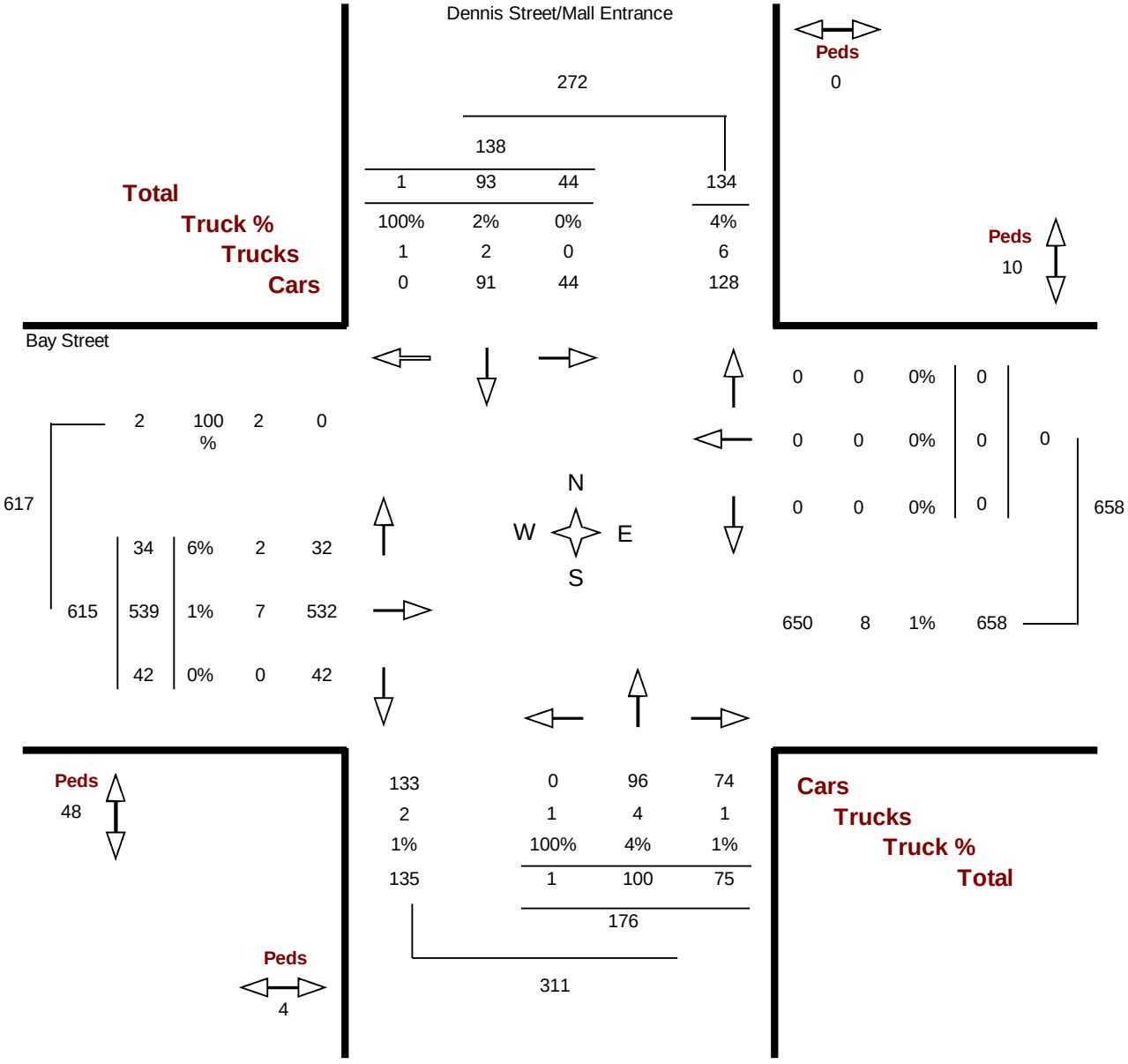
Turning Movements Report - PM Period

Location..... Bay Street @ Dennis Street/Mall Entrance

Municipality..... Sault Ste. Marie

GeoID..... 3251

Count Date..... Thursday, 12 October, 2017 **Peak Hour.....** 04:00 PM — 05:00 PM



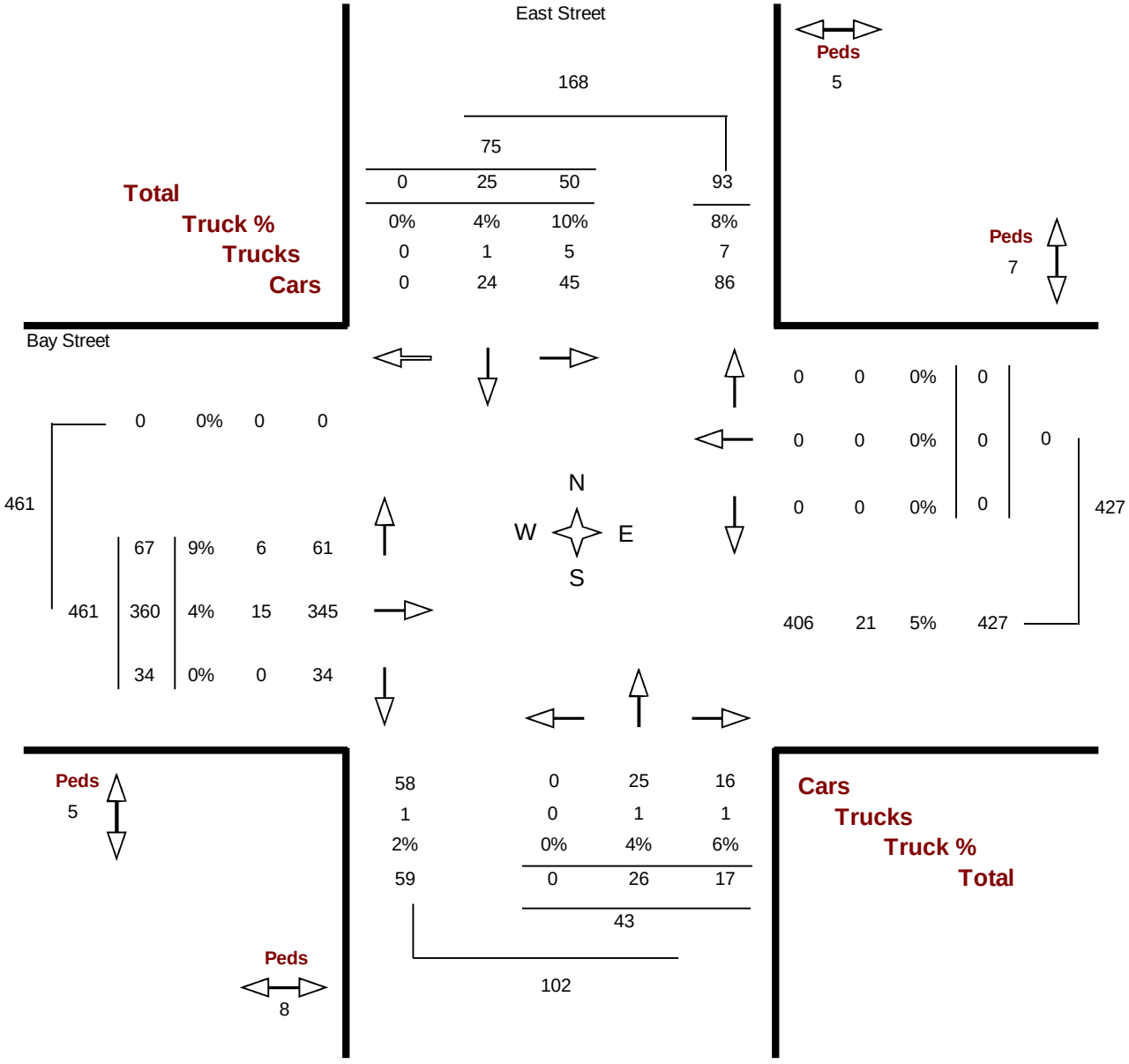
Turning Movements Report - AM Period

Location..... Bay Street @ East Street

Municipality..... Sault Ste. Marie

GeoID..... 1289

Count Date..... Tuesday, 07 November, 2017 **Peak Hour.....** 10:00 AM — 11:00 AM



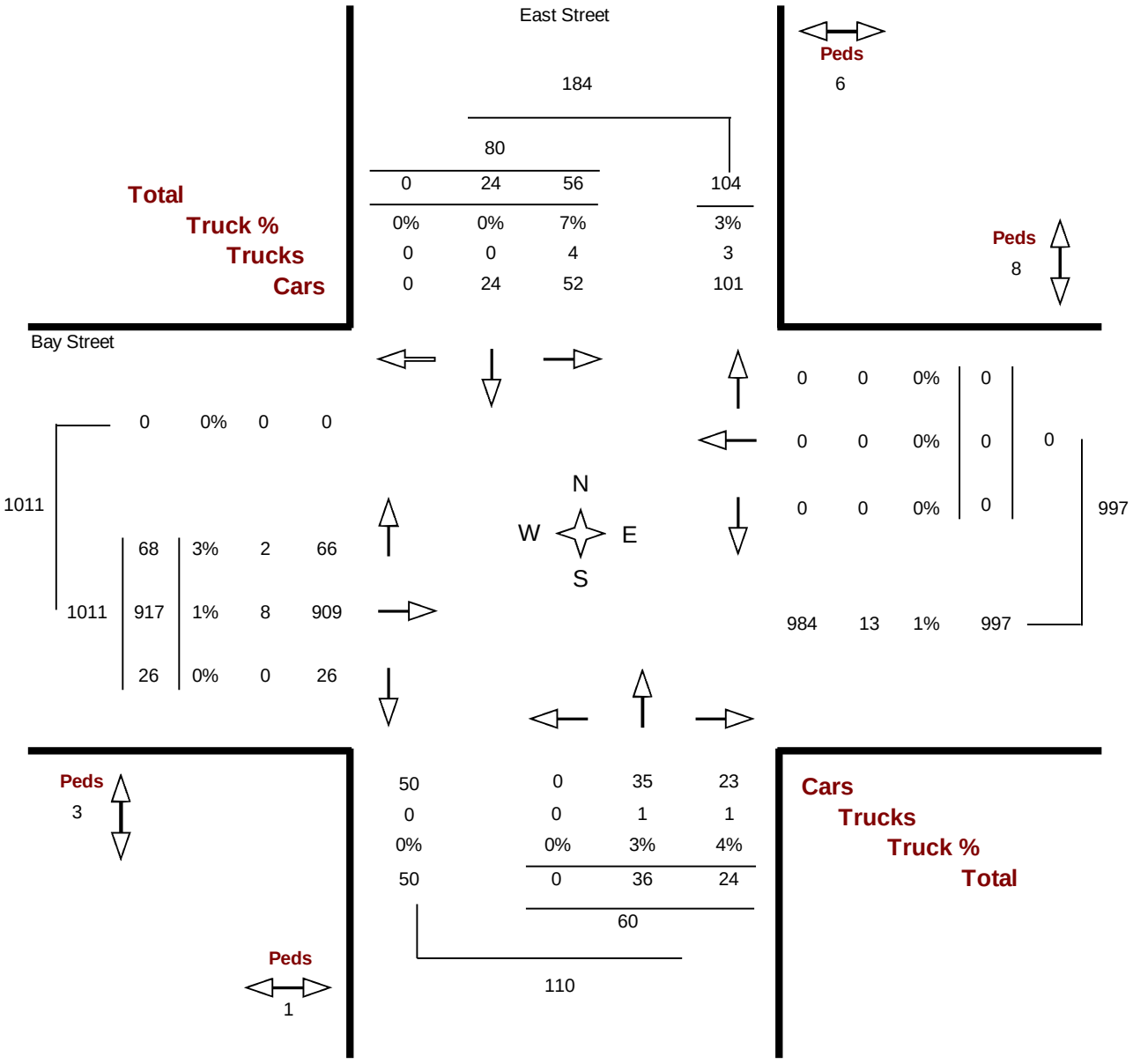
Turning Movements Report - PM Period

Location..... Bay Street @ East Street

Municipality..... Sault Ste. Marie

GeoID..... 1289

Count Date..... Tuesday, 07 November, 2017 **Peak Hour.....** 04:15 PM — 05:15 PM



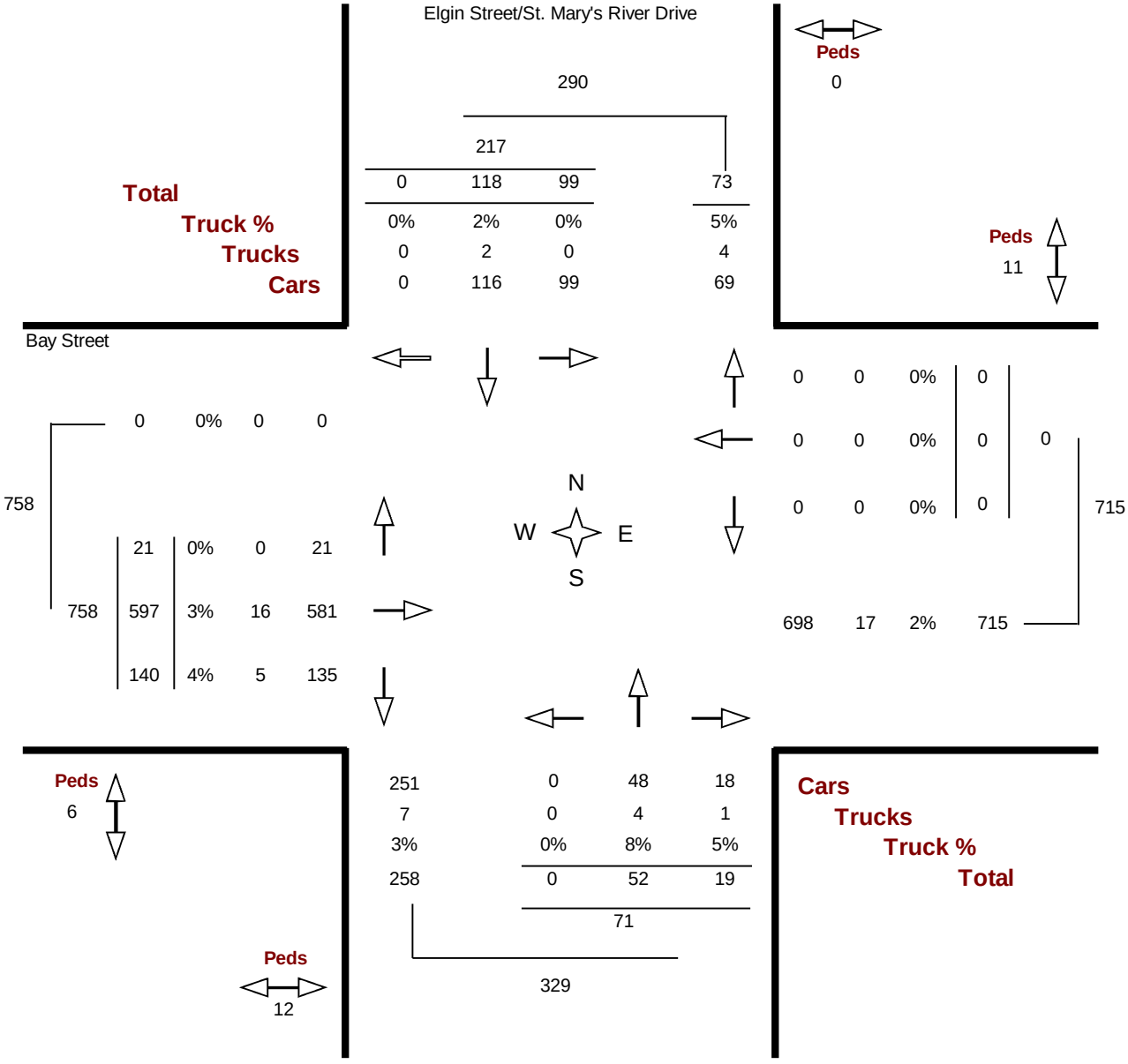
Turning Movements Report - AM Period

Location..... Bay Street @ Elgin Street/St. Mary's River Drive

Municipality..... Sault Ste. Marie

GeoID..... 10269

Count Date..... Thursday, 19 October, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



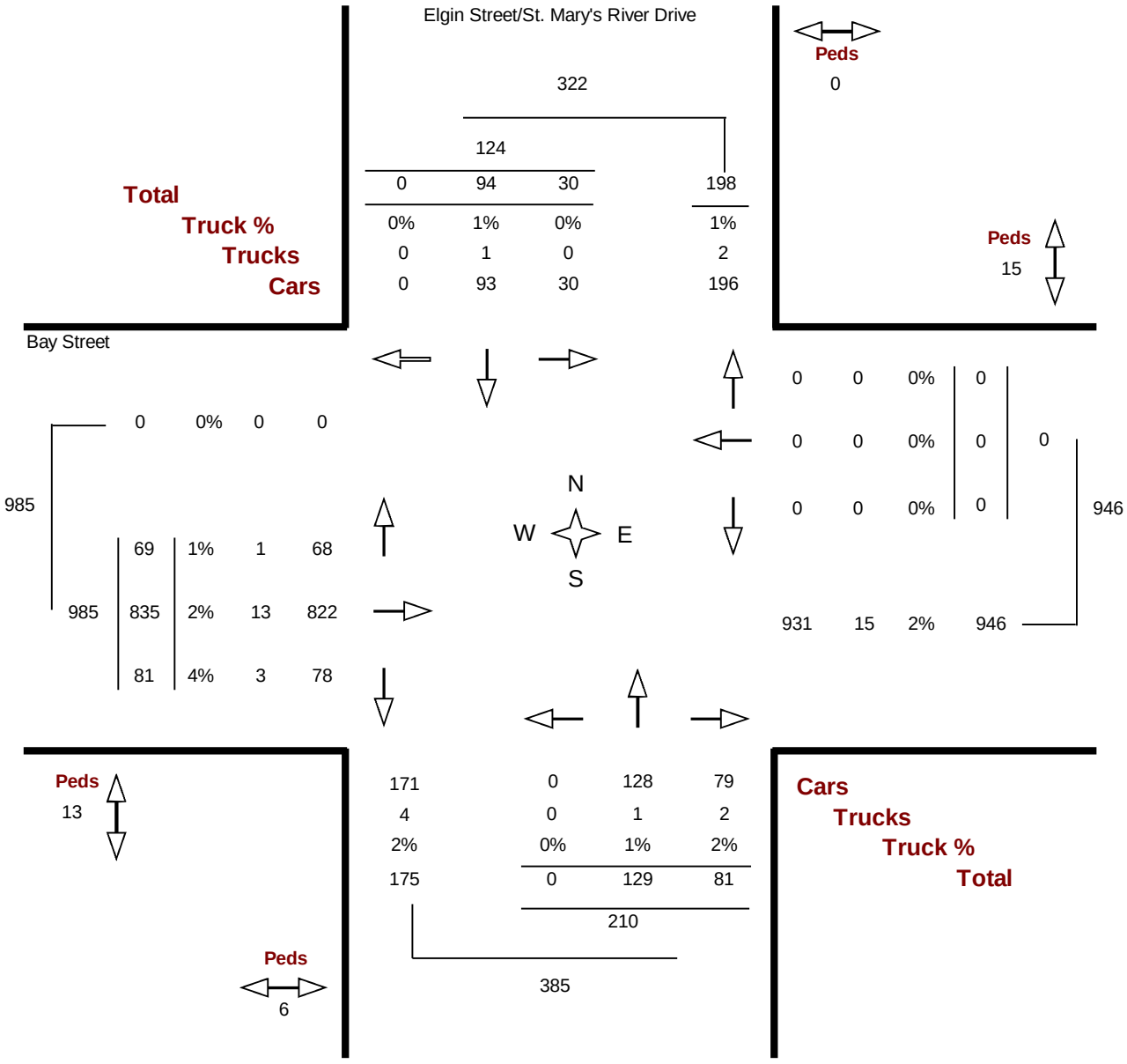
Turning Movements Report - PM Period

Location..... Bay Street @ Elgin Street/St. Mary's River Drive

Municipality..... Sault Ste. Marie

GeoID..... 10269

Count Date..... Thursday, 19 October, 2017 **Peak Hour.....** 03:00 PM — 04:00 PM



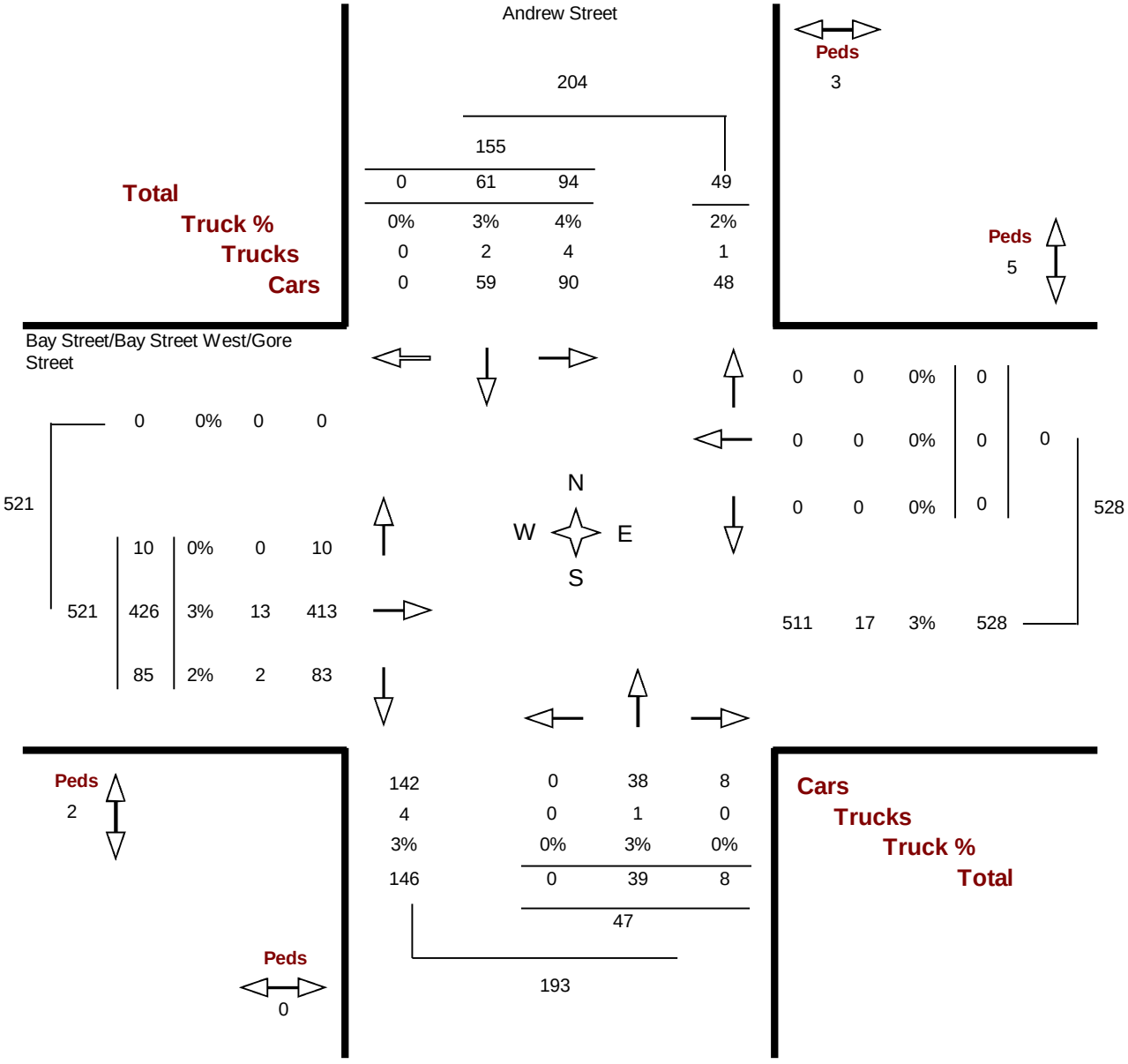
Turning Movements Report - AM Period

Location..... Andrew Street @ Bay Street/Bay Street West/Gore Street

Municipality..... Sault Ste. Marie

GeoID..... 14105

Count Date..... Tuesday, 03 October, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



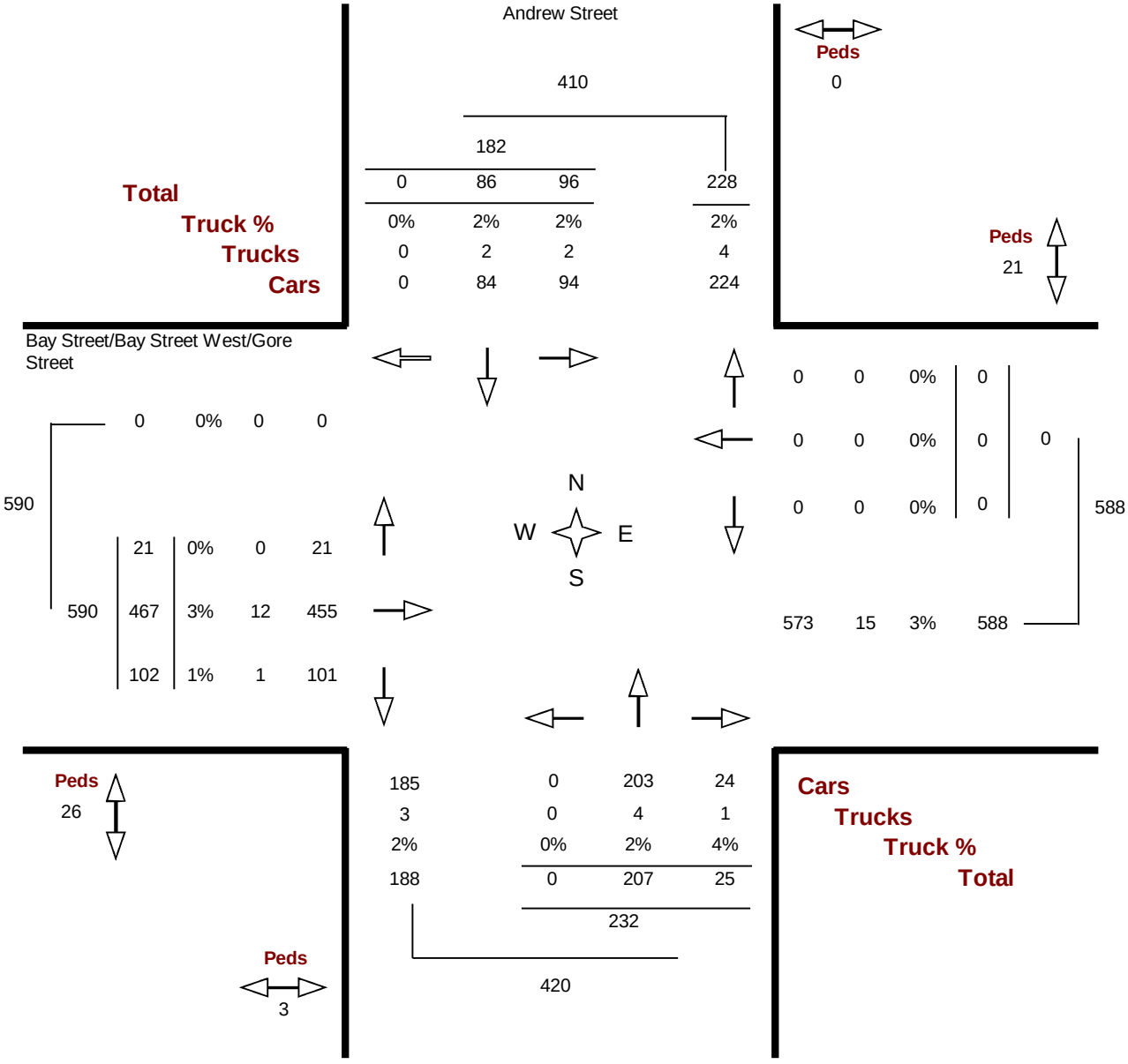
Turning Movements Report - PM Period

Location..... Andrew Street @ Bay Street/Bay Street West/Gore Street

Municipality..... Sault Ste. Marie

GeoID..... 14105

Count Date..... Tuesday, 03 October, 2017 **Peak Hour.....** 03:00 PM — 04:00 PM



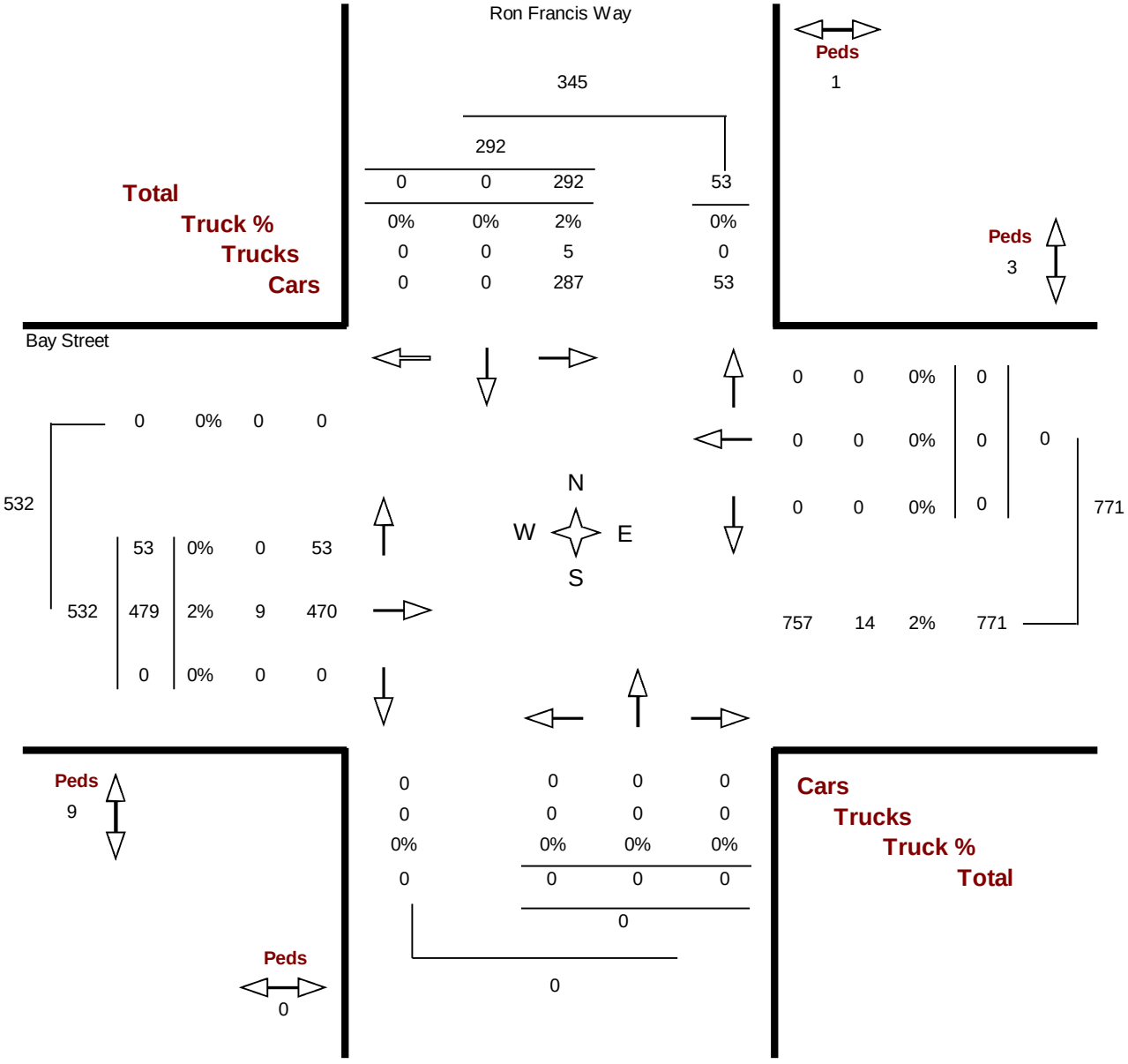
Turning Movements Report - AM Period

Location..... Bay Street @ Ron Francis Way

Municipality..... Sault Ste. Marie

GeoID..... 8340

Count Date..... Tuesday, 17 October, 2017 **Peak Hour.....** 08:00 AM — 09:00 AM



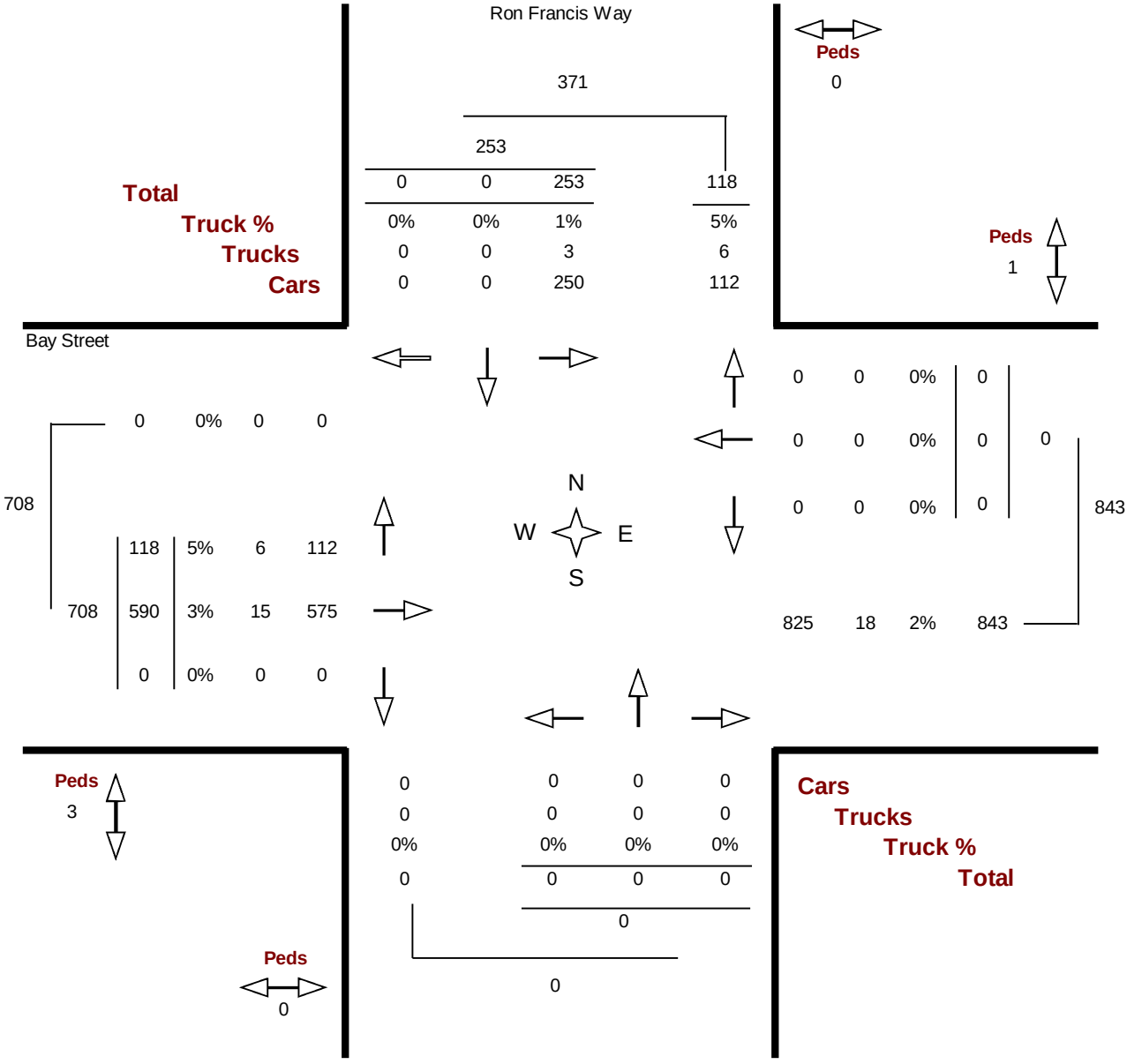
Turning Movements Report - PM Period

Location..... Bay Street @ Ron Francis Way

Municipality..... Sault Ste. Marie

GeoID..... 8340

Count Date..... Tuesday, 17 October, 2017 **Peak Hour.....** 03:00 PM — 04:00 PM



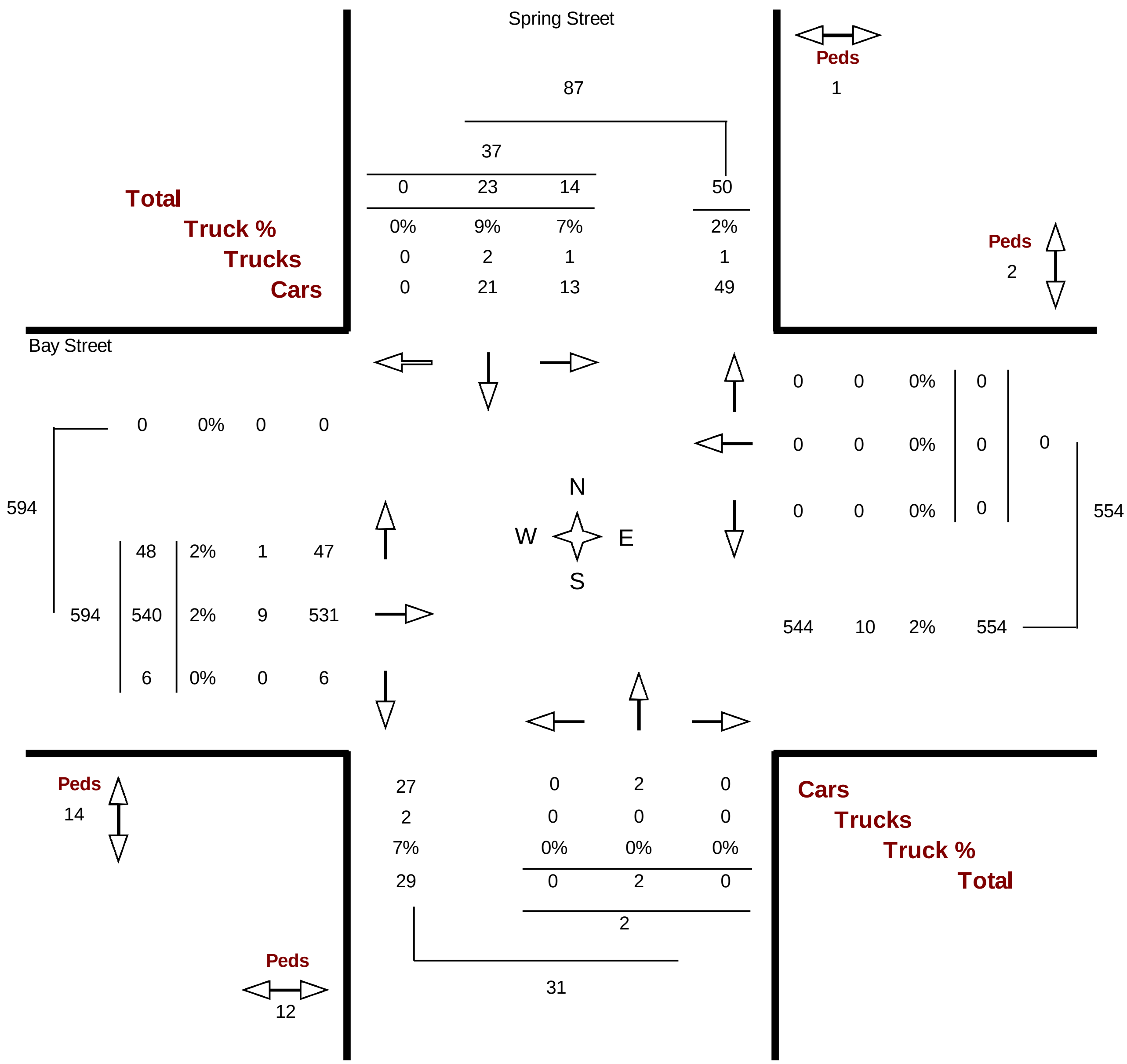
Turning Movements Report - AM Period

Location............ Bay Street @ Spring Street

Municipality....... Sault Ste. Marie

GeoID....... 10247

Count Date....... Thursday, 26 October, 2017 **Peak Hour......** 10:00 AM — 11:00 AM



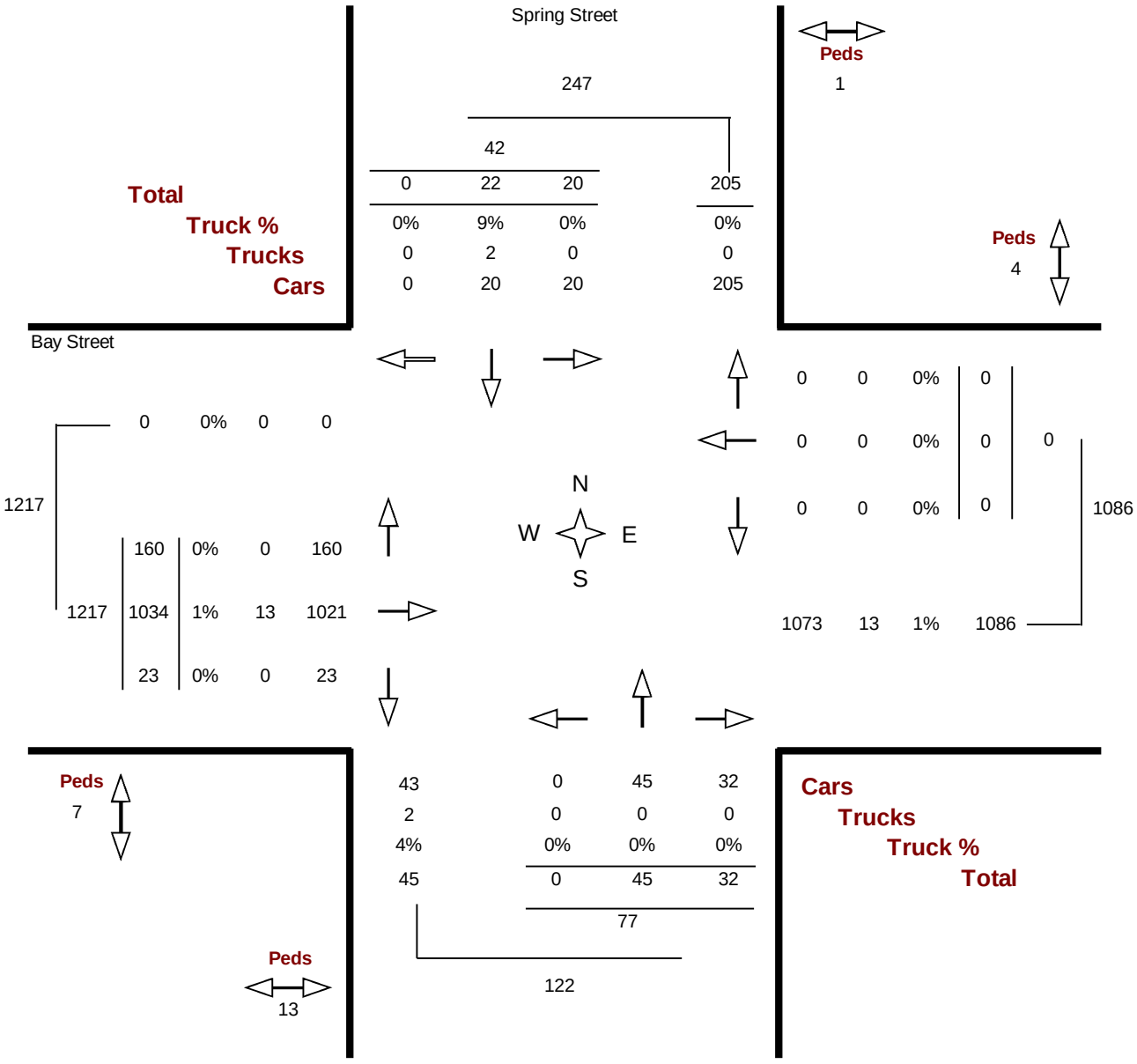
Turning Movements Report - PM Period

Location..... Bay Street @ Spring Street

Municipality..... Sault Ste. Marie

GeoID..... 10247

Count Date..... Thursday, 26 October, 2017 **Peak Hour.....** 04:30 PM — 05:30 PM



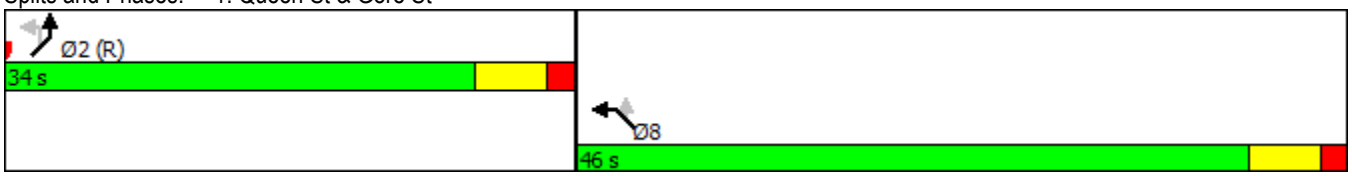
Appendix B – Existing Conditions (2017)
Synchro Output

Lane Group	EBL	EBR	SBL	SBR	NWL	NWR	NEL2	NEL	NER
Lane Configurations									
Traffic Volume (vph)	0	0	0	0	245	154	62	85	0
Future Volume (vph)	0	0	0	0	245	154	62	85	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	20.0		0.0	0.0
Storage Lanes	0	0	0	0	2	1		2	0
Taper Length (m)	7.6		7.6		7.6			2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	0.91	1.00	1.00	1.00
Ped Bike Factor					0.99	0.97	0.99		
Frt					0.984	0.850			
Flt Protected					0.957		0.950	0.950	
Satd. Flow (prot)	0	0	0	0	3300	1429	1789	1789	0
Flt Permitted					0.957		0.950	0.950	
Satd. Flow (perm)	0	0	0	0	3300	1387	1777	1789	0
Right Turn on Red						Yes	Yes		Yes
Satd. Flow (RTOR)					41	135	67		
Link Speed (k/h)	50		50		50			50	
Link Distance (m)	126.3		146.9		303.7			230.8	
Travel Time (s)	9.1		10.6		21.9			16.6	
Confl. Peds. (#/hr)						13	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	6%	4%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	266	167	67	92	0
Shared Lane Traffic (%)						19%			
Lane Group Flow (vph)	0	0	0	0	298	135	67	92	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		7.4			7.4	
Link Offset(m)	0.0		0.0		0.0			0.0	
Crosswalk Width(m)	4.9		4.9		4.9			1.6	
Two way Left Turn Lane									
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14	24	14	24	14	24	24	14
Turn Type					Prot	Perm	Perm	Prot	
Protected Phases					8			2	
Permitted Phases						8	2		
Minimum Split (s)					24.0	24.0	24.0	24.0	
Total Split (s)					46.0	46.0	34.0	34.0	
Total Split (%)					57.5%	57.5%	42.5%	42.5%	
Maximum Green (s)					40.0	40.0	28.0	28.0	
Yellow Time (s)					4.3	4.3	4.3	4.3	
All-Red Time (s)					1.7	1.7	1.7	1.7	
Lost Time Adjust (s)					0.0	0.0	0.0	0.0	
Total Lost Time (s)					6.0	6.0	6.0	6.0	
Lead/Lag									
Lead-Lag Optimize?									
Walk Time (s)					7.0	7.0	7.0	7.0	
Flash Dont Walk (s)					11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)					0	0	0	0	

Lane Group	EBL	EBR	SBL	SBR	NWL	NWR	NEL2	NEL	NER
Act Effct Green (s)					40.0	40.0	28.0	28.0	
Actuated g/C Ratio					0.50	0.50	0.35	0.35	
v/c Ratio					0.18	0.18	0.10	0.15	
Control Delay					9.7	2.7	4.3	16.8	
Queue Delay					0.0	0.0	0.0	0.0	
Total Delay					9.7	2.7	4.3	16.8	
LOS					A	A	A	B	
Approach Delay					7.5			11.5	
Approach LOS					A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NEL and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.18			
Intersection Signal Delay: 8.6		Intersection LOS: A	
Intersection Capacity Utilization 40.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Queen St & Gore St

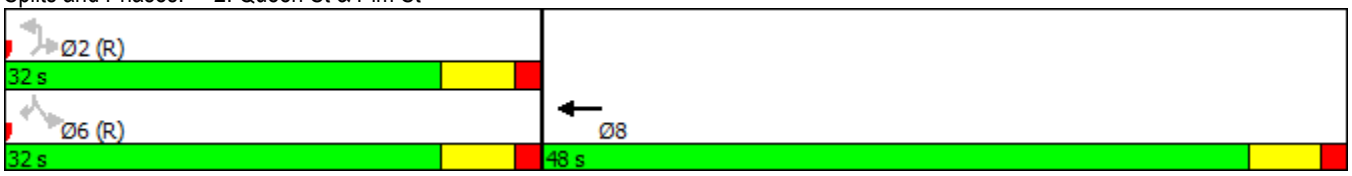


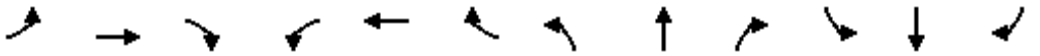
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	601	0	42	0	169	45	0	254
Future Volume (vph)	0	0	0	0	601	0	42	0	169	45	0	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor							0.96		0.98	1.00		0.92
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	3614	0	1825	0	1570	1755	0	2818
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	0	0	0	3614	0	1759	0	1545	1748	0	2596
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)									184	215		1920
Link Speed (k/h)		50			50		50				50	
Link Distance (m)		482.4			182.3		146.3				146.3	
Travel Time (s)		34.7			13.1		10.5				10.5	
Confl. Peds. (#/hr)							27		3	3		27
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
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	4%	4%	0%	2%
Adj. Flow (vph)	0	0	0	0	653	0	46	0	184	49	0	276
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	653	0	46	0	184	49	0	276
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Right	Left	Left	Right
Median Width(m)		3.7			3.7		3.7				3.7	
Link Offset(m)		0.0			0.0		0.0				0.0	
Crosswalk Width(m)		4.9			4.9		4.9				4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24	14	14	24	24	14
Turn Type					NA		Perm		Perm	Perm		Perm
Protected Phases					8							
Permitted Phases							6		6	2		2
Minimum Split (s)					24.0		24.0		24.0	24.0		24.0
Total Split (s)					48.0		32.0		32.0	32.0		32.0
Total Split (%)					60.0%		40.0%		40.0%	40.0%		40.0%
Maximum Green (s)					42.0		26.0		26.0	26.0		26.0
Yellow Time (s)					4.3		4.3		4.3	4.3		4.3
All-Red Time (s)					1.7		1.7		1.7	1.7		1.7
Lost Time Adjust (s)					0.0		0.0		0.0	0.0		0.0
Total Lost Time (s)					6.0		6.0		6.0	6.0		6.0
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)					7.0		7.0		7.0	7.0		7.0
Flash Dont Walk (s)					11.0		11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)					0		0		0	0		0
Act Effct Green (s)					42.0		26.0		26.0	26.0		26.0
Actuated g/C Ratio					0.52		0.32		0.32	0.32		0.32
v/c Ratio					0.34		0.08		0.29	0.07		0.13

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Control Delay					11.7		19.3		4.7	0.2		0.1
Queue Delay					0.0		0.0		0.0	0.0		0.0
Total Delay					11.7		19.3		4.7	0.2		0.1
LOS					B		B		A	A		A
Approach Delay					11.7		7.6				0.1	
Approach LOS					B		A				A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NEL and 6:SBL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.34			
Intersection Signal Delay: 7.8		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Queen St & Pim St



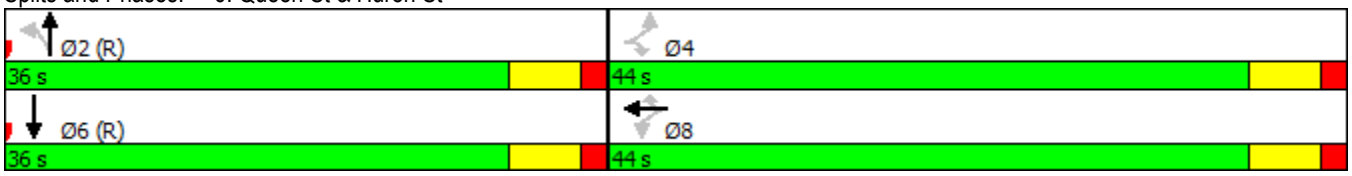


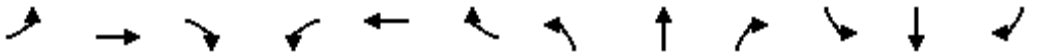
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	0	197	47	152	113	7	10	0	0	128	32
Future Volume (vph)	28	0	197	47	152	113	7	10	0	0	128	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor			0.98		1.00			1.00			1.00	
Frt			0.850			0.850					0.970	
Flt Protected	0.950				0.988			0.979				
Satd. Flow (prot)	1755	0	1570	0	1792	1585	0	3375	0	0	3251	0
Flt Permitted	0.623				0.988			0.878				
Satd. Flow (perm)	1151	0	1539	0	1788	1585	0	3017	0	0	3251	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214			123					35	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			811.3			155.6			172.7	
Travel Time (s)		11.9			58.4			11.2			12.4	
Confl. Peds. (#/hr)			6	6			7					7
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
Heavy Vehicles (%)	4%	0%	4%	9%	5%	3%	14%	0%	0%	0%	2%	34%
Adj. Flow (vph)	30	0	214	51	165	123	8	11	0	0	139	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	0	214	0	216	123	0	19	0	0	174	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4		4	8		8	2					
Minimum Split (s)	24.0		24.0	24.0	24.0	24.0	24.0	24.0			24.0	
Total Split (s)	44.0		44.0	44.0	44.0	44.0	36.0	36.0			36.0	
Total Split (%)	55.0%		55.0%	55.0%	55.0%	55.0%	45.0%	45.0%			45.0%	
Maximum Green (s)	38.0		38.0	38.0	38.0	38.0	30.0	30.0			30.0	
Yellow Time (s)	4.3		4.3	4.3	4.3	4.3	4.3	4.3			4.3	
All-Red Time (s)	1.7		1.7	1.7	1.7	1.7	1.7	1.7			1.7	
Lost Time Adjust (s)	0.0		0.0		0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0		6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0		7.0	7.0	7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0	11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0		0	0	0	0	0	0			0	
Act Effct Green (s)	38.0		38.0		38.0	38.0		30.0			30.0	
Actuated g/C Ratio	0.48		0.48		0.48	0.48		0.38			0.38	
v/c Ratio	0.05		0.25		0.25	0.15		0.02			0.14	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	11.8		2.7		13.6	2.9		15.9			13.5	
Queue Delay	0.0		0.0		0.0	0.0		0.0			0.0	
Total Delay	11.8		2.7		13.6	2.9		15.9			13.5	
LOS	B		A		B	A		B			B	
Approach Delay		3.8			9.7			15.9			13.5	
Approach LOS		A			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.25			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 60.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Queen St & Huron St



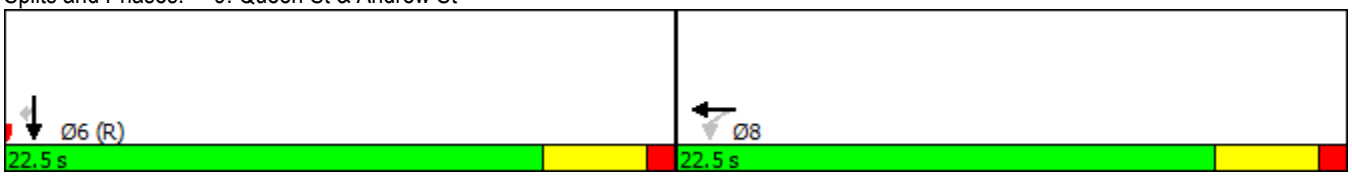


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	1883	3579	0	0	0	0	0	1883	1883
Flt Permitted												
Satd. Flow (perm)	0	0	0	1883	3579	0	0	0	0	0	1883	1883
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		811.3			126.3			208.8			246.8	
Travel Time (s)		58.4			9.1			15.0			17.8	
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
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm								Perm
Protected Phases					8						6	
Permitted Phases				8								6
Minimum Split (s)				22.5	22.5						22.5	22.5
Total Split (s)				22.5	22.5						22.5	22.5
Total Split (%)				50.0%	50.0%						50.0%	50.0%
Maximum Green (s)				18.0	18.0						18.0	18.0
Yellow Time (s)				3.5	3.5						3.5	3.5
All-Red Time (s)				1.0	1.0						1.0	1.0
Lost Time Adjust (s)				0.0	0.0						0.0	0.0
Total Lost Time (s)				4.5	4.5						4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)				7.0	7.0						7.0	7.0
Flash Dont Walk (s)				11.0	11.0						11.0	11.0
Pedestrian Calls (#/hr)				0	0						0	0
Act Effct Green (s)												
Actuated g/C Ratio												
v/c Ratio												
Control Delay												
Queue Delay												
Total Delay												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS												
Approach Delay												
Approach LOS												

Intersection Summary			
Area Type:	Other		
Cycle Length: 45			
Actuated Cycle Length: 45			
Offset: 0 (0%), Referenced to phase 2: and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Pretimed			
Maximum v/c Ratio: 0.00			
Intersection Signal Delay: 0.0		Intersection LOS: A	
Intersection Capacity Utilization 15.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Queen St & Andrew St

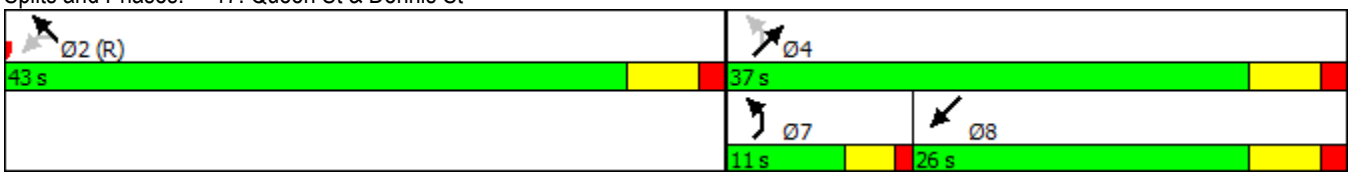


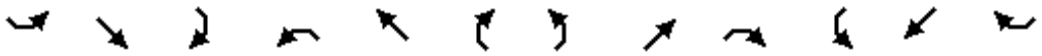
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	73	332	21	64	48	0	0	58	18
Future Volume (vph)	0	0	0	73	332	21	64	48	0	0	58	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	10.0		0.0	7.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor				1.00	1.00		0.97				0.99	
Frt					0.991						0.964	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1807	3404	0	1772	1746	0	0	3325	0
Flt Permitted				0.950			0.584					
Satd. Flow (perm)	0	0	0	1805	3404	0	1060	1746	0	0	3325	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11						20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		399.7			421.0			126.2			167.2	
Travel Time (s)		28.8			30.3			9.1			12.0	
Confl. Peds. (#/hr)				1		14	25					25
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
Heavy Vehicles (%)	0%	0%	0%	1%	6%	5%	3%	10%	0%	0%	3%	10%
Adj. Flow (vph)	0	0	0	79	361	23	70	52	0	0	63	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	79	384	0	70	52	0	0	83	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		7	4			8	
Permitted Phases				2			4					
Minimum Split (s)				24.0	24.0		11.0	24.0			24.0	
Total Split (s)				43.0	43.0		11.0	37.0			26.0	
Total Split (%)				53.8%	53.8%		13.8%	46.3%			32.5%	
Maximum Green (s)				37.0	37.0		7.0	31.0			20.0	
Yellow Time (s)				4.3	4.3		3.0	4.3			4.3	
All-Red Time (s)				1.7	1.7		1.0	1.7			1.7	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				6.0	6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)				37.0	37.0		33.0	31.0			20.0	
Actuated g/C Ratio				0.46	0.46		0.41	0.39			0.25	
v/c Ratio				0.09	0.24		0.14	0.08			0.10	
Control Delay				11.5	12.1		14.8	21.3			18.7	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				11.5	12.1		14.8	21.3			18.7	
LOS				B	B		B	C			B	
Approach Delay					12.0			17.5			18.7	
Approach LOS					B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.24			
Intersection Signal Delay: 13.8		Intersection LOS: B	
Intersection Capacity Utilization 49.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 17: Queen St & Dennis St



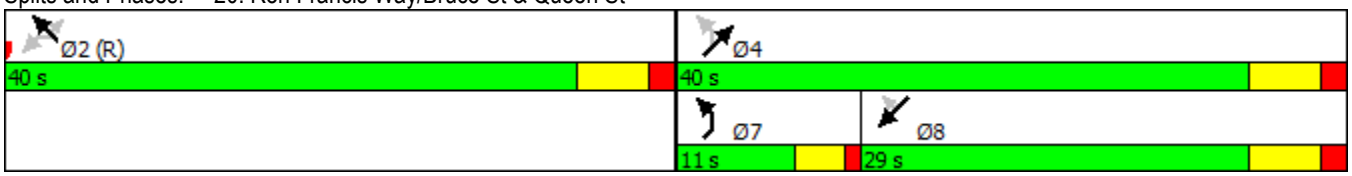


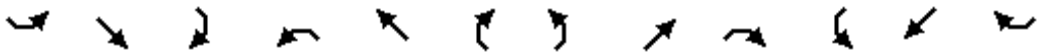
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	39	352	87	5	82	0	0	191	81
Future Volume (vph)	0	0	0	39	352	87	5	82	0	0	191	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		20.0	10.0		0.0	0.0		0.0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		0.94	0.99					0.97
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1738	3476	1617	1825	1830	0	0	1883	1555
Flt Permitted				0.950			0.501					
Satd. Flow (perm)	0	0	0	1708	3476	1528	954	1830	0	0	1883	1514
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95						95
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		421.0			395.0			183.9			166.9	
Travel Time (s)		30.3			28.4			13.2			12.0	
Confl. Peds. (#/hr)				13		33	11					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
Heavy Vehicles (%)	0%	0%	0%	5%	5%	1%	0%	5%	0%	0%	2%	5%
Adj. Flow (vph)	0	0	0	42	383	95	5	89	0	0	208	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	42	383	95	5	89	0	0	208	88
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					2		7	4			8	
Permitted Phases				2		2	4					8
Minimum Split (s)				24.0	24.0	24.0	11.0	24.0			24.0	24.0
Total Split (s)				40.0	40.0	40.0	11.0	40.0			29.0	29.0
Total Split (%)				50.0%	50.0%	50.0%	13.8%	50.0%			36.3%	36.3%
Maximum Green (s)				34.0	34.0	34.0	7.0	34.0			23.0	23.0
Yellow Time (s)				4.3	4.3	4.3	3.0	4.3			4.3	4.3
All-Red Time (s)				1.7	1.7	1.7	1.0	1.7			1.7	1.7
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				6.0	6.0	6.0	4.0	6.0			6.0	6.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0	0		0			0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)				34.0	34.0	34.0	36.0	34.0			23.0	23.0
Actuated g/C Ratio				0.42	0.42	0.42	0.45	0.42			0.29	0.29
v/c Ratio				0.06	0.26	0.13	0.01	0.11			0.38	0.18
Control Delay				14.1	14.5	4.4	9.2	10.0			25.4	5.6
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				14.1	14.5	4.4	9.2	10.0			25.4	5.6
LOS				B	B	A	A	B			C	A
Approach Delay					12.6			10.0			19.5	
Approach LOS					B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.38			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 53.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 20: Ron Francis Way/Bruce St & Queen St



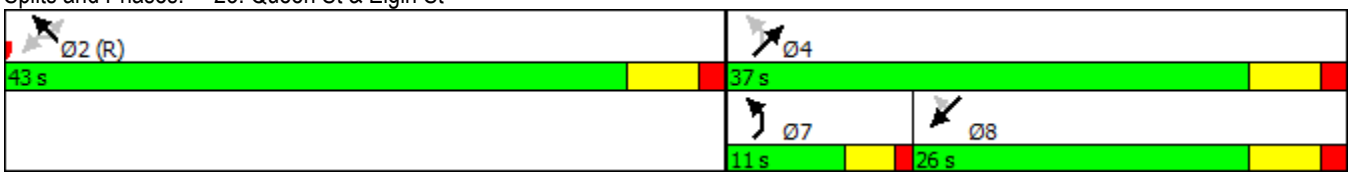


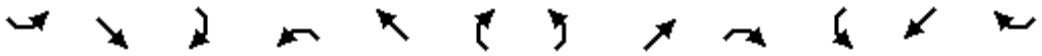
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	127	331	52	40	43	0	0	88	10
Future Volume (vph)	0	0	0	127	331	52	40	43	0	0	88	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	50.0		50.0	10.0		0.0	0.0		0.0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99		0.97	0.99					0.97
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1807	3544	1601	1772	1921	0	0	1921	1633
Flt Permitted				0.950			0.579					
Satd. Flow (perm)	0	0	0	1787	3544	1559	1068	1921	0	0	1921	1590
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95						95
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		395.0			353.4			117.3			174.7	
Travel Time (s)		28.4			25.4			8.4			12.6	
Confl. Peds. (#/hr)				5		11	11					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
Heavy Vehicles (%)	0%	0%	0%	1%	3%	2%	3%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	138	360	57	43	47	0	0	96	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	138	360	57	43	47	0	0	96	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					2		7	4			8	
Permitted Phases				2		2	4					8
Minimum Split (s)				24.0	24.0	24.0	11.0	24.0			24.0	24.0
Total Split (s)				43.0	43.0	43.0	11.0	37.0			26.0	26.0
Total Split (%)				53.8%	53.8%	53.8%	13.8%	46.3%			32.5%	32.5%
Maximum Green (s)				37.0	37.0	37.0	7.0	31.0			20.0	20.0
Yellow Time (s)				4.3	4.3	4.3	3.0	4.3			4.3	4.3
All-Red Time (s)				1.7	1.7	1.7	1.0	1.7			1.7	1.7
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				6.0	6.0	6.0	4.0	6.0			6.0	6.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0	0		0			0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)				37.0	37.0	37.0	33.0	31.0			20.0	20.0
Actuated g/C Ratio				0.46	0.46	0.46	0.41	0.39			0.25	0.25
v/c Ratio				0.17	0.22	0.07	0.09	0.06			0.20	0.02
Control Delay				13.2	13.3	1.3	11.6	13.1			25.1	0.1
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				13.2	13.3	1.3	11.6	13.1			25.1	0.1
LOS				B	B	A	B	B			C	A
Approach Delay					12.1			12.4			22.5	
Approach LOS					B			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay: 13.6		Intersection LOS: B	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Queen St & Elgin St



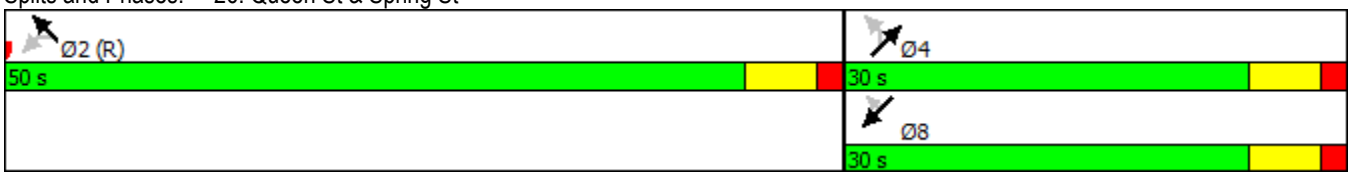


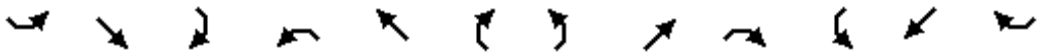
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	50	487	31	21	20	0	0	76	20
Future Volume (vph)	0	0	0	50	487	31	21	20	0	0	76	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	10.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.992							0.850
Flt Protected					0.996		0.950					
Satd. Flow (prot)	0	0	0	0	3528	0	1825	1921	0	0	1921	1633
Flt Permitted					0.996		0.703					
Satd. Flow (perm)	0	0	0	0	3526	0	1351	1921	0	0	1921	1633
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12							41
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		182.2			279.4			172.0			124.0	
Travel Time (s)		13.1			20.1			12.4			8.9	
Confl. Peds. (#/hr)				3		6						
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
Heavy Vehicles (%)	0%	0%	0%	0%	2%	6%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	54	529	34	23	22	0	0	83	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	617	0	23	22	0	0	83	22
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					2			4			8	
Permitted Phases				2			4					8
Minimum Split (s)				24.0	24.0		24.0	24.0			24.0	24.0
Total Split (s)				50.0	50.0		30.0	30.0			30.0	30.0
Total Split (%)				62.5%	62.5%		37.5%	37.5%			37.5%	37.5%
Maximum Green (s)				44.0	44.0		24.0	24.0			24.0	24.0
Yellow Time (s)				4.3	4.3		4.3	4.3			4.3	4.3
All-Red Time (s)				1.7	1.7		1.7	1.7			1.7	1.7
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)					6.0		6.0	6.0			6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0		0	0			0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)					44.0		24.0	24.0			24.0	24.0
Actuated g/C Ratio					0.55		0.30	0.30			0.30	0.30
v/c Ratio					0.32		0.06	0.04			0.14	0.04
Control Delay					9.4		12.8	12.6			21.4	3.4
Queue Delay					0.0		0.0	0.0			0.0	0.0
Total Delay					9.4		12.8	12.6			21.4	3.4
LOS					A		B	B			C	A
Approach Delay					9.4			12.7			17.6	
Approach LOS					A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.32			
Intersection Signal Delay: 10.7		Intersection LOS: B	
Intersection Capacity Utilization 61.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 26: Queen St & Spring St



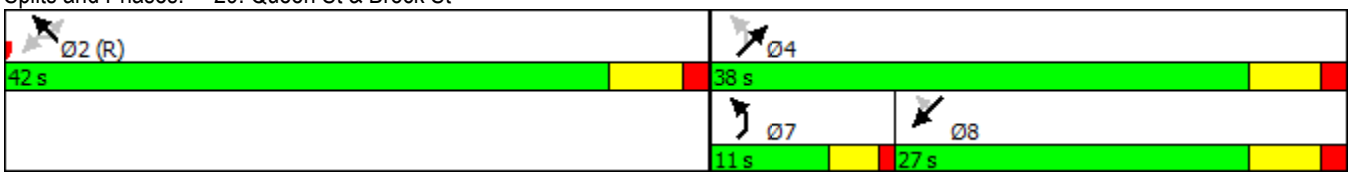


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	200	468	25	15	48	0	0	104	43
Future Volume (vph)	0	0	0	200	468	25	15	48	0	0	104	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	20.0		13.0	10.0		0.0	0.0		0.0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98		0.95	0.99					0.97
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1807	3614	1633	1706	1921	0	0	1902	1633
Flt Permitted				0.950			0.575					
Satd. Flow (perm)	0	0	0	1763	3614	1551	1020	1921	0	0	1902	1588
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95						95
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		279.4			414.3			129.8			110.9	
Travel Time (s)		20.1			29.8			9.3			8.0	
Confl. Peds. (#/hr)				11		29	12					12
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
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%	7%	0%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	217	509	27	16	52	0	0	113	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	217	509	27	16	52	0	0	113	47
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					2		7	4			8	
Permitted Phases				2		2	4					8
Minimum Split (s)				24.0	24.0	24.0	11.0	24.0			24.0	24.0
Total Split (s)				42.0	42.0	42.0	11.0	38.0			27.0	27.0
Total Split (%)				52.5%	52.5%	52.5%	13.8%	47.5%			33.8%	33.8%
Maximum Green (s)				36.0	36.0	36.0	7.0	32.0			21.0	21.0
Yellow Time (s)				4.3	4.3	4.3	3.0	4.3			4.3	4.3
All-Red Time (s)				1.7	1.7	1.7	1.0	1.7			1.7	1.7
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				6.0	6.0	6.0	4.0	6.0			6.0	6.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0	0		0			0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)				36.0	36.0	36.0	34.0	32.0			21.0	21.0
Actuated g/C Ratio				0.45	0.45	0.45	0.42	0.40			0.26	0.26
v/c Ratio				0.27	0.31	0.04	0.03	0.07			0.23	0.10
Control Delay				27.2	26.7	5.1	12.3	13.2			24.6	1.4
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				27.2	26.7	5.1	12.3	13.2			24.6	1.4
LOS				C	C	A	B	B			C	A
Approach Delay					26.1			13.0			17.8	
Approach LOS					C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.31			
Intersection Signal Delay: 23.8		Intersection LOS: C	
Intersection Capacity Utilization 64.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 29: Queen St & Brock St



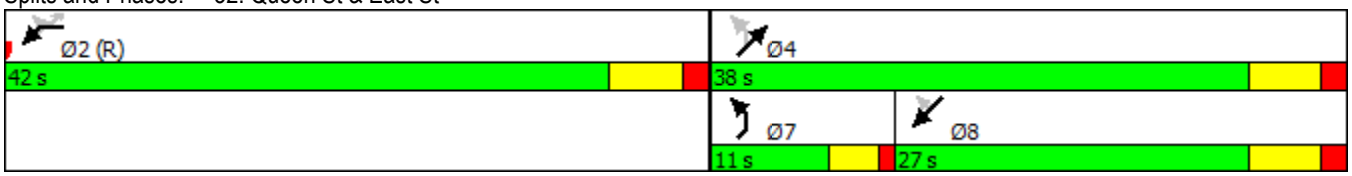
Lane Group	WBL	WBR	WBR2	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	97	654	57	0	0	20	58	0	0	9	11
Future Volume (vph)	97	654	57	0	0	20	58	0	0	9	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0	40.0		0.0	0.0	10.0		0.0	0.0		0.0
Storage Lanes	1	1		0	0	1		0	0		1
Taper Length (m)	7.6			7.6		7.6			7.6		
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.96			1.00					0.98
Frt		0.850	0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	1807	2846	1570	0	0	1825	1830	0	0	1628	1633
Flt Permitted	0.950					0.631					
Satd. Flow (perm)	1775	2846	1511	0	0	1208	1830	0	0	1628	1607
Right Turn on Red			Yes		Yes			Yes			Yes
Satd. Flow (RTOR)			95								95
Link Speed (k/h)	50			50			50			50	
Link Distance (m)	482.4			414.3			126.8			174.2	
Travel Time (s)	34.7			29.8			9.1			12.5	
Confl. Peds. (#/hr)	8		8			3					3
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
Heavy Vehicles (%)	1%	1%	4%	0%	0%	0%	5%	0%	0%	18%	0%
Adj. Flow (vph)	105	711	62	0	0	22	63	0	0	10	12
Shared Lane Traffic (%)											
Lane Group Flow (vph)	105	711	62	0	0	22	63	0	0	10	12
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.7			3.7			3.7			3.7	
Link Offset(m)	0.0			0.0			0.0			0.0	
Crosswalk Width(m)	4.9			4.9			4.9			4.9	
Two way Left Turn Lane											
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14	14	24	14	24		14	24		14
Turn Type	Prot	Perm	Perm			pm+pt	NA			NA	Perm
Protected Phases	2					7	4			8	
Permitted Phases		2	2			4					8
Minimum Split (s)	24.0	24.0	24.0			11.0	24.0			24.0	24.0
Total Split (s)	42.0	42.0	42.0			11.0	38.0			27.0	27.0
Total Split (%)	52.5%	52.5%	52.5%			13.8%	47.5%			33.8%	33.8%
Maximum Green (s)	36.0	36.0	36.0			7.0	32.0			21.0	21.0
Yellow Time (s)	4.3	4.3	4.3			3.0	4.3			4.3	4.3
All-Red Time (s)	1.7	1.7	1.7			1.0	1.7			1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0			4.0	6.0			6.0	6.0
Lead/Lag						Lead				Lag	Lag
Lead-Lag Optimize?						Yes				Yes	Yes
Walk Time (s)	7.0	7.0	7.0				7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0				11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0	0				0			0	0

Lane Group	WBL	WBR	WBR2	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)	36.0	36.0	36.0			34.0	32.0			21.0	21.0
Actuated g/C Ratio	0.45	0.45	0.45			0.42	0.40			0.26	0.26
v/c Ratio	0.13	0.56	0.08			0.04	0.09			0.02	0.02
Control Delay	9.2	14.8	3.2			9.4	10.0			22.2	0.1
Queue Delay	0.0	0.0	0.0			0.0	0.0			0.0	0.0
Total Delay	9.2	14.8	3.2			9.4	10.0			22.2	0.1
LOS	A	B	A			A	B			C	A
Approach Delay	13.3						9.9			10.2	
Approach LOS	B						A			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:WBL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 12.9		Intersection LOS: B	
Intersection Capacity Utilization 74.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 32: Queen St & East St



Lane Group	WBL	WBR	SEL2	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	0	0	67	360	34	0	26	17	50	25	0
Future Volume (vph)	0	0	67	360	34	0	26	17	50	25	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	0.0	0.0		0.0	10.0		0.0
Storage Lanes	0	0		4	0	0		0	1		0
Taper Length (m)	2.5			2.5		2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.99	1.00			0.99		0.99		
Frt				0.987			0.947				
Flt Protected			0.950	0.956					0.950		
Satd. Flow (prot)	0	0	1674	4916	0	0	1722	0	1659	1847	0
Flt Permitted			0.950	0.956					0.727		
Satd. Flow (perm)	0	0	1656	4916	0	0	1722	0	1259	1847	0
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)				41			18				
Link Speed (k/h)	50			50			50			50	
Link Distance (m)	463.6			477.7			112.4			142.9	
Travel Time (s)	33.4			34.4			8.1			10.3	
Confl. Peds. (#/hr)			5		8			7	7		
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
Heavy Vehicles (%)	0%	0%	9%	4%	0%	0%	4%	6%	10%	4%	0%
Adj. Flow (vph)	0	0	73	391	37	0	28	18	54	27	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	73	428	0	0	46	0	54	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0			14.8			3.7			3.7	
Link Offset(m)	0.0			0.0			0.0			0.0	
Crosswalk Width(m)	1.6			1.6			1.6			1.6	
Two way Left Turn Lane											
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14	24	24	14	24		14	24		14
Turn Type			Prot	Prot			NA		Perm	NA	
Protected Phases			6	6			4			8	
Permitted Phases									8		
Minimum Split (s)			26.0	26.0			27.0		27.0	27.0	
Total Split (s)			48.0	48.0			32.0		32.0	32.0	
Total Split (%)			60.0%	60.0%			40.0%		40.0%	40.0%	
Maximum Green (s)			42.0	42.0			26.0		26.0	26.0	
Yellow Time (s)			4.3	4.3			4.3		4.3	4.3	
All-Red Time (s)			1.7	1.7			1.7		1.7	1.7	
Lost Time Adjust (s)			0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)			6.0	6.0			6.0		6.0	6.0	
Lead/Lag											
Lead-Lag Optimize?											
Walk Time (s)			7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)			0	0			0		0	0	

Lane Group	WBL	WBR	SEL2	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)			42.0	42.0			26.0		26.0	26.0	
Actuated g/C Ratio			0.52	0.52			0.32		0.32	0.32	
v/c Ratio			0.08	0.16			0.08		0.13	0.04	
Control Delay			10.0	9.4			13.6		23.6	21.6	
Queue Delay			0.0	0.0			0.0		0.0	0.0	
Total Delay			10.0	9.4			13.6		23.6	21.6	
LOS			B	A			B		C	C	
Approach Delay				9.5			13.6			23.0	
Approach LOS				A			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 6:SEL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.16			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 74.8%		ICU Level of Service D	
Analysis Period (min) 15			

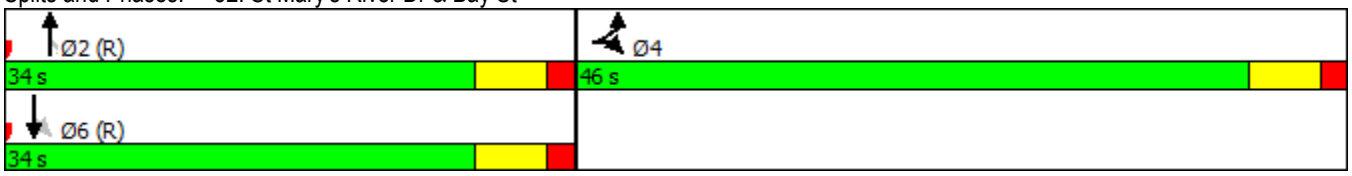
Splits and Phases: 43: East St & Bay St

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations											
Traffic Volume (vph)	10	426	85	0	39	8	90	59	0	0	0
Future Volume (vph)	10	426	85	0	39	8	90	59	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98	0.99				
Frt		0.850				0.850					
Flt Protected	0.950						0.950				
Satd. Flow (prot)	1825	2795	0	0	1865	1633	1755	1865	0	0	0
Flt Permitted	0.950						0.730				
Satd. Flow (perm)	1825	2795	0	0	1865	1603	1340	1865	0	0	0
Right Turn on Red			Yes			Yes			Yes		Yes
Satd. Flow (RTOR)		41				41					
Link Speed (k/h)	50				50			50		50	
Link Distance (m)	835.3				175.6			55.3		32.8	
Travel Time (s)	60.1				12.6			4.0		2.4	
Confl. Peds. (#/hr)						5	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
Heavy Vehicles (%)	0%	3%	2%	0%	3%	0%	4%	3%	0%	0%	0%
Adj. Flow (vph)	11	463	92	0	42	9	98	64	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	11	555	0	0	42	9	98	64	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Right
Median Width(m)	3.7				3.7			3.7		0.0	
Link Offset(m)	0.0				0.0			0.0		0.0	
Crosswalk Width(m)	1.6				1.6			1.6		1.6	
Two way Left Turn Lane											
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14	14	24		14	24		14	24	14
Turn Type	Prot	Prot			NA	Perm	Perm	NA			
Protected Phases	4	4			2			6			
Permitted Phases						2	6				
Minimum Split (s)	24.0	24.0			24.0	24.0	24.0	24.0			
Total Split (s)	46.0	46.0			34.0	34.0	34.0	34.0			
Total Split (%)	57.5%	57.5%			42.5%	42.5%	42.5%	42.5%			
Maximum Green (s)	40.0	40.0			28.0	28.0	28.0	28.0			
Yellow Time (s)	4.3	4.3			4.3	4.3	4.3	4.3			
All-Red Time (s)	1.7	1.7			1.7	1.7	1.7	1.7			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0			
Total Lost Time (s)	6.0	6.0			6.0	6.0	6.0	6.0			
Lead/Lag											
Lead-Lag Optimize?											
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0			
Pedestrian Calls (#/hr)	0	0			0	0	0	0			
Act Effct Green (s)	40.0	40.0			28.0	28.0	28.0	28.0			
Actuated g/C Ratio	0.50	0.50			0.35	0.35	0.35	0.35			
v/c Ratio	0.01	0.39			0.06	0.02	0.21	0.10			

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Control Delay	10.2	12.4			17.7	0.0	19.8	18.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0			
Total Delay	10.2	12.4			17.7	0.0	19.8	18.1			
LOS	B	B			B	A	B	B			
Approach Delay	12.4				14.6			19.1			
Approach LOS	B				B			B			

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 62.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 52: St Mary's River Dr & Bay St

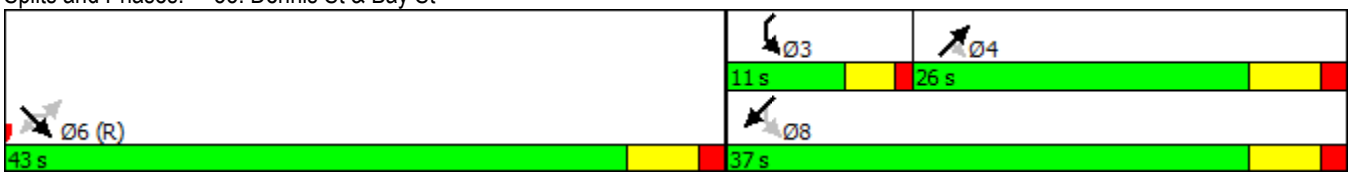


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	18	513	22	0	0	0	0	18	17	17	51	0
Future Volume (vph)	18	513	22	0	0	0	0	18	17	17	51	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		30.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	0		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									0.97	0.98		
Frt			0.850						0.850			
Flt Protected		0.998								0.950		
Satd. Flow (prot)	0	6423	1633	0	0	0	0	1642	1541	1825	1921	0
Flt Permitted		0.998								0.620		
Satd. Flow (perm)	0	6423	1633	0	0	0	0	1642	1492	1170	1921	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95						95			
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		391.5			415.0			76.5			153.4	
Travel Time (s)		28.2			29.9			5.5			11.0	
Confl. Peds. (#/hr)									15	15		
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
Heavy Vehicles (%)	22%	2%	0%	0%	0%	0%	0%	17%	6%	0%	0%	0%
Adj. Flow (vph)	20	558	24	0	0	0	0	20	18	18	55	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	578	24	0	0	0	0	20	18	18	55	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		6						4		3	8	
Permitted Phases	6		6						4	8		
Minimum Split (s)	24.0	24.0	24.0					24.0	24.0	11.0	24.0	
Total Split (s)	43.0	43.0	43.0					26.0	26.0	11.0	37.0	
Total Split (%)	53.8%	53.8%	53.8%					32.5%	32.5%	13.8%	46.3%	
Maximum Green (s)	37.0	37.0	37.0					20.0	20.0	7.0	31.0	
Yellow Time (s)	4.3	4.3	4.3					4.3	4.3	3.0	4.3	
All-Red Time (s)	1.7	1.7	1.7					1.7	1.7	1.0	1.7	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0					6.0	6.0	4.0	6.0	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0	11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0	0					0	0		0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)		37.0	37.0					20.0	20.0	33.0	31.0	
Actuated g/C Ratio		0.46	0.46					0.25	0.25	0.41	0.39	
v/c Ratio		0.19	0.03					0.05	0.04	0.03	0.07	
Control Delay		12.9	0.1					23.3	0.2	13.1	25.4	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		12.9	0.1					23.3	0.2	13.1	25.4	
LOS		B	A					C	A	B	C	
Approach Delay		12.4						12.4			22.3	
Approach LOS		B						B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.19			
Intersection Signal Delay: 13.4		Intersection LOS: B	
Intersection Capacity Utilization 49.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 55: Dennis St & Bay St



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	53	479	0	0	292	0
Future Volume (vph)	53	479	0	0	292	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.86	1.00	1.00	0.97	1.00
Ped Bike Factor		1.00			1.00	
Frt						
Flt Protected		0.995			0.950	
Satd. Flow (prot)	0	6459	0	0	3471	0
Flt Permitted		0.995			0.950	
Satd. Flow (perm)	0	6458	0	0	3457	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						
Link Speed (k/h)		50	50		50	
Link Distance (m)		415.0	398.0		94.8	
Travel Time (s)		29.9	28.7		6.8	
Confl. Peds. (#/hr)	1				3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	58	521	0	0	317	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	579	0	0	317	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Turn Type	Perm	NA			Prot	
Protected Phases		6			8	
Permitted Phases	6					
Minimum Split (s)	24.0	24.0			24.0	
Total Split (s)	46.0	46.0			34.0	
Total Split (%)	57.5%	57.5%			42.5%	
Maximum Green (s)	40.0	40.0			28.0	
Yellow Time (s)	4.3	4.3			4.3	
All-Red Time (s)	1.7	1.7			1.7	
Lost Time Adjust (s)		0.0			0.0	
Total Lost Time (s)		6.0			6.0	
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)		40.0			28.0	
Actuated g/C Ratio		0.50			0.35	
v/c Ratio		0.18			0.26	

Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Control Delay		9.4			27.6	
Queue Delay		0.0			0.0	
Total Delay		9.4			27.6	
LOS		A			C	
Approach Delay		9.4			27.6	
Approach LOS		A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 15.8		Intersection LOS: B	
Intersection Capacity Utilization 86.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 57: Bay St & Ron Francis Way

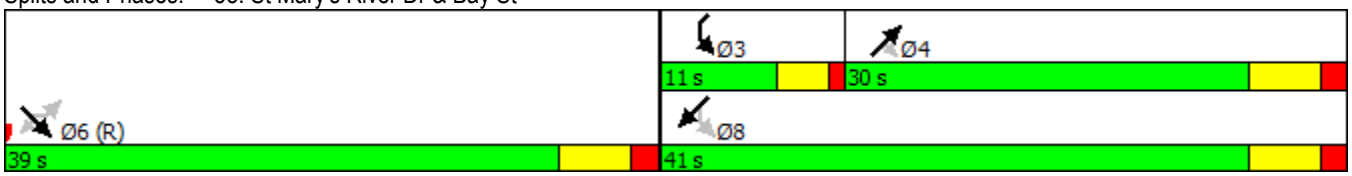
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	21	597	140	0	0	0	0	52	19	99	116	0
Future Volume (vph)	21	597	140	0	0	0	0	52	19	99	116	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		50.0	0.0		0.0	0.0		0.0	10.0		0.0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.95						0.97	0.99		
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1825	5092	1570	0	0	0	0	1779	1555	1825	1883	0
Flt Permitted	0.950									0.617		
Satd. Flow (perm)	1825	5092	1498	0	0	0	0	1779	1514	1171	1883	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152						95			
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		398.0			530.2			91.8			164.0	
Travel Time (s)		28.7			38.2			6.6			11.8	
Confl. Peds. (#/hr)			12						11	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
Heavy Vehicles (%)	0%	3%	4%	0%	0%	0%	0%	8%	5%	0%	2%	0%
Adj. Flow (vph)	23	649	152	0	0	0	0	57	21	108	126	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	649	152	0	0	0	0	57	21	108	126	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		6						4		3	8	
Permitted Phases	6		6						4	8		
Minimum Split (s)	25.0	25.0	25.0					27.0	27.0	11.0	27.0	
Total Split (s)	39.0	39.0	39.0					30.0	30.0	11.0	41.0	
Total Split (%)	48.8%	48.8%	48.8%					37.5%	37.5%	13.8%	51.3%	
Maximum Green (s)	33.0	33.0	33.0					24.0	24.0	7.0	35.0	
Yellow Time (s)	4.3	4.3	4.3					4.3	4.3	3.0	4.3	
All-Red Time (s)	1.7	1.7	1.7					1.7	1.7	1.0	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0					6.0	6.0	4.0	6.0	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0	11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0	0					0	0		0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)	33.0	33.0	33.0					24.0	24.0	37.0	35.0	
Actuated g/C Ratio	0.41	0.41	0.41					0.30	0.30	0.46	0.44	
v/c Ratio	0.03	0.31	0.21					0.11	0.04	0.18	0.15	
Control Delay	8.8	11.2	6.8					21.0	0.2	18.6	26.4	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	8.8	11.2	6.8					21.0	0.2	18.6	26.4	
LOS	A	B	A					C	A	B	C	
Approach Delay		10.3						15.4			22.8	
Approach LOS		B						B			C	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green
Natural Cycle: 65
Control Type: Pretimed
Maximum v/c Ratio: 0.31
Intersection Signal Delay: 13.2 Intersection LOS: B
Intersection Capacity Utilization 52.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 58: St Mary's River Dr & Bay St



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	48	540	6	0	0	0	0	2	0	14	23	0
Future Volume (vph)	48	540	6	0	0	0	0	2	0	14	23	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		5.0	10.0		0.0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00								0.99		
Frt		0.998										
Flt Protected		0.996								0.950		
Satd. Flow (prot)	0	6438	0	0	0	0	0	1921	1921	1706	1762	0
Flt Permitted		0.996								0.757		
Satd. Flow (perm)	0	6437	0	0	0	0	0	1921	1921	1345	1762	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5										
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		530.2			275.3			91.5			95.4	
Travel Time (s)		38.2			19.8			6.6			6.9	
Confl. Peds. (#/hr)	1		12						8	8		
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
Heavy Vehicles (%)	2%	2%	0%	0%	0%	0%	0%	0%	0%	7%	9%	0%
Adj. Flow (vph)	52	587	7	0	0	0	0	2	0	15	25	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	646	0	0	0	0	0	2	0	15	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA						NA	Perm	Perm	NA	
Protected Phases		6						4			8	
Permitted Phases	6								4	8		
Minimum Split (s)	27.0	27.0						24.0	24.0	24.0	24.0	
Total Split (s)	56.0	56.0						24.0	24.0	24.0	24.0	
Total Split (%)	70.0%	70.0%						30.0%	30.0%	30.0%	30.0%	
Maximum Green (s)	50.0	50.0						18.0	18.0	18.0	18.0	
Yellow Time (s)	4.3	4.3						4.3	4.3	4.3	4.3	
All-Red Time (s)	1.7	1.7						1.7	1.7	1.7	1.7	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0						6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0						7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0						0	0	0	0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)		50.0						18.0		18.0	18.0	
Actuated g/C Ratio		0.62						0.22		0.22	0.22	
v/c Ratio		0.16						0.00		0.05	0.06	
Control Delay		4.8						24.0		16.9	16.7	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		4.8						24.0		16.9	16.7	
LOS		A						C		B	B	
Approach Delay		4.8						24.0			16.8	
Approach LOS		A						C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.16			
Intersection Signal Delay: 5.6		Intersection LOS: A	
Intersection Capacity Utilization 61.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 60: Spring St & Bay St

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	85	440	34	0	0	0	0	19	47	26	95	0
Future Volume (vph)	85	440	34	0	0	0	0	19	47	26	95	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	10.0		0.0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99							0.98	0.99		
Frt		0.991							0.850			
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	6197	0	0	0	0	0	1921	1570	1825	1865	0
Flt Permitted		0.992								0.744		
Satd. Flow (perm)	0	6170	0	0	0	0	0	1921	1535	1414	1865	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25							51			
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		275.3			477.7			103.0			137.3	
Travel Time (s)		19.8			34.4			7.4			9.9	
Confl. Peds. (#/hr)	13		16						8	8		
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
Heavy Vehicles (%)	0%	5%	9%	0%	0%	0%	0%	0%	4%	0%	3%	0%
Adj. Flow (vph)	92	478	37	0	0	0	0	21	51	28	103	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	607	0	0	0	0	0	21	51	28	103	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA						NA	Perm	Perm	NA	
Protected Phases		6						4			8	
Permitted Phases	6								4	8		
Minimum Split (s)	27.0	27.0						25.0	25.0	25.0	25.0	
Total Split (s)	48.0	48.0						32.0	32.0	32.0	32.0	
Total Split (%)	60.0%	60.0%						40.0%	40.0%	40.0%	40.0%	
Maximum Green (s)	42.0	42.0						26.0	26.0	26.0	26.0	
Yellow Time (s)	4.3	4.3						4.3	4.3	4.3	4.3	
All-Red Time (s)	1.7	1.7						1.7	1.7	1.7	1.7	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0						6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0						7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0						0	0	0	0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)		42.0						26.0	26.0	26.0	26.0	
Actuated g/C Ratio		0.52						0.32	0.32	0.32	0.32	
v/c Ratio		0.19						0.03	0.10	0.06	0.17	
Control Delay		12.4						18.7	6.5	25.1	25.4	
Queue Delay		0.0						0.0	0.0	0.0	0.0	
Total Delay		12.4						18.7	6.5	25.1	25.4	
LOS		B						B	A	C	C	
Approach Delay		12.4						10.0			25.3	
Approach LOS		B						B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.19			
Intersection Signal Delay: 14.3		Intersection LOS: B	
Intersection Capacity Utilization 64.2%		ICU Level of Service C	
Analysis Period (min) 15			

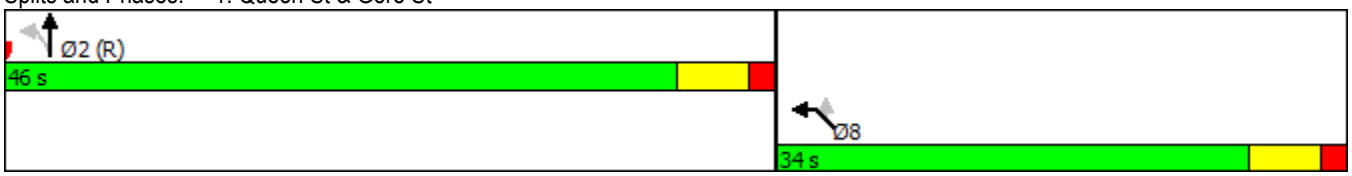
Splits and Phases: 62: Foster Dr/Brock St & Bay St

Lane Group	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	0	0	178	156	0	0	0	0	596	254
Future Volume (vph)	0	0	178	156	0	0	0	0	596	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	20.0
Storage Lanes	0	0	1		0	0		0	2	1
Taper Length (m)	7.6		2.5			7.6			7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.91
Ped Bike Factor									1.00	0.96
Frt									0.994	0.850
Flt Protected			0.950						0.954	
Satd. Flow (prot)	0	0	1789	1883	0	0	0	0	3423	1457
Flt Permitted			0.950						0.954	
Satd. Flow (perm)	0	0	1789	1883	0	0	0	0	3423	1397
Right Turn on Red			Yes		Yes			Yes		Yes
Satd. Flow (RTOR)			93						41	195
Link Speed (k/h)	50			50			50		50	
Link Distance (m)	126.3			243.2			146.9		303.7	
Travel Time (s)	9.1			17.5			10.6		21.9	
Confl. Peds. (#/hr)										22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	0%	2%	0%	3%	2%
Adj. Flow (vph)	0	0	193	170	0	0	0	0	648	276
Shared Lane Traffic (%)										10%
Lane Group Flow (vph)	0	0	193	170	0	0	0	0	676	248
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right
Median Width(m)	0.0			3.7			3.7		7.4	
Link Offset(m)	0.0			0.0			0.0		0.0	
Crosswalk Width(m)	4.9			1.6			4.9		4.9	
Two way Left Turn Lane										
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14	24		14	24		14	24	14
Turn Type			Perm	NA					Prot	Perm
Protected Phases				2					8	
Permitted Phases			2							8
Minimum Split (s)			46.0	46.0					34.0	34.0
Total Split (s)			46.0	46.0					34.0	34.0
Total Split (%)			57.5%	57.5%					42.5%	42.5%
Maximum Green (s)			40.0	40.0					28.0	28.0
Yellow Time (s)			4.3	4.3					4.3	4.3
All-Red Time (s)			1.7	1.7					1.7	1.7
Lost Time Adjust (s)			0.0	0.0					0.0	0.0
Total Lost Time (s)			6.0	6.0					6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Walk Time (s)			7.0	7.0					7.0	7.0
Flash Dont Walk (s)			11.0	11.0					11.0	11.0
Pedestrian Calls (#/hr)			0	0					0	0

Lane Group	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Act Effct Green (s)			40.0	40.0					28.0	28.0
Actuated g/C Ratio			0.50	0.50					0.35	0.35
v/c Ratio			0.21	0.18					0.55	0.40
Control Delay			2.8	7.3					21.7	7.4
Queue Delay			0.0	0.0					0.0	0.0
Total Delay			2.8	7.3					21.7	7.4
LOS			A	A					C	A
Approach Delay				4.9					17.8	
Approach LOS				A					B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 44.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Queen St & Gore St

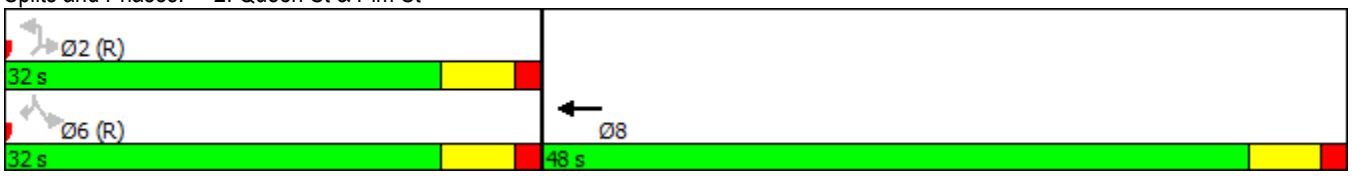


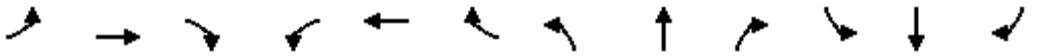
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	405	0	48	0	165	98	0	989
Future Volume (vph)	0	0	0	0	405	0	48	0	165	98	0	989
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor							0.99		0.99	1.00		0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	3614	0	1789	0	1585	1825	0	2846
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	0	0	0	3614	0	1777	0	1564	1823	0	2758
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)									179	369		1920
Link Speed (k/h)		50			50		50				50	
Link Distance (m)		482.4			182.3		146.3				146.3	
Travel Time (s)		34.7			13.1		10.5				10.5	
Confl. Peds. (#/hr)							5		1	1		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
Heavy Vehicles (%)	2%	2%	2%	0%	1%	0%	2%	0%	3%	0%	0%	1%
Adj. Flow (vph)	0	0	0	0	440	0	52	0	179	107	0	1075
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	440	0	52	0	179	107	0	1075
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Right	Left	Left	Right
Median Width(m)		3.7			3.7		3.7				3.7	
Link Offset(m)		0.0			0.0		0.0				0.0	
Crosswalk Width(m)		4.9			4.9		4.9				4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24	14	14	24	24	14
Turn Type					NA		Perm		Perm	Perm		Perm
Protected Phases					8							
Permitted Phases							6		6	2		2
Minimum Split (s)					24.0		24.0		24.0	24.0		24.0
Total Split (s)					48.0		32.0		32.0	32.0		32.0
Total Split (%)					60.0%		40.0%		40.0%	40.0%		40.0%
Maximum Green (s)					42.0		26.0		26.0	26.0		26.0
Yellow Time (s)					4.3		4.3		4.3	4.3		4.3
All-Red Time (s)					1.7		1.7		1.7	1.7		1.7
Lost Time Adjust (s)					0.0		0.0		0.0	0.0		0.0
Total Lost Time (s)					6.0		6.0		6.0	6.0		6.0
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)					7.0		7.0		7.0	7.0		7.0
Flash Dont Walk (s)					11.0		11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)					0		0		0	0		0
Act Effct Green (s)					42.0		26.0		26.0	26.0		26.0
Actuated g/C Ratio					0.52		0.32		0.32	0.32		0.32
v/c Ratio					0.23		0.09		0.28	0.13		0.49

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Control Delay					10.7		19.4		4.7	0.3		0.8
Queue Delay					0.0		0.0		0.0	0.0		0.0
Total Delay					10.7		19.4		4.7	0.3		0.8
LOS					B		B		A	A		A
Approach Delay					10.7		8.0				0.7	
Approach LOS					B		A				A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NEL and 6:SBL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 4.0		Intersection LOS: A	
Intersection Capacity Utilization 55.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Queen St & Pim St



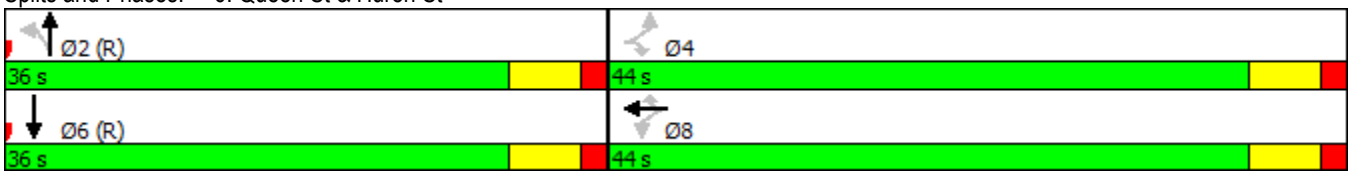


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	0	321	45	361	233	18	29	0	0	130	41
Future Volume (vph)	34	0	321	45	361	233	18	29	0	0	130	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00		0.98		1.00	0.99		1.00			1.00	
Frt			0.850			0.850					0.964	
Flt Protected	0.950				0.994			0.981				
Satd. Flow (prot)	1825	0	1601	0	1860	1617	0	3500	0	0	3336	0
Flt Permitted	0.405				0.994			0.849				
Satd. Flow (perm)	777	0	1571	0	1859	1593	0	3028	0	0	3336	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			349			253					45	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		165.1			811.3			155.6			172.7	
Travel Time (s)		11.9			58.4			11.2			12.4	
Confl. Peds. (#/hr)	2		5	5		2	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
Heavy Vehicles (%)	0%	0%	2%	16%	1%	1%	6%	0%	0%	0%	2%	15%
Adj. Flow (vph)	37	0	349	49	392	253	20	32	0	0	141	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	0	349	0	441	253	0	52	0	0	186	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm		Perm	Perm	NA	Perm	Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4		4	8		8	2					
Minimum Split (s)	24.0		24.0	24.0	24.0	24.0	24.0	24.0			24.0	
Total Split (s)	44.0		44.0	44.0	44.0	44.0	36.0	36.0			36.0	
Total Split (%)	55.0%		55.0%	55.0%	55.0%	55.0%	45.0%	45.0%			45.0%	
Maximum Green (s)	38.0		38.0	38.0	38.0	38.0	30.0	30.0			30.0	
Yellow Time (s)	4.3		4.3	4.3	4.3	4.3	4.3	4.3			4.3	
All-Red Time (s)	1.7		1.7	1.7	1.7	1.7	1.7	1.7			1.7	
Lost Time Adjust (s)	0.0		0.0		0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.0		6.0		6.0	6.0		6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0		7.0	7.0	7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0	11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0		0	0	0	0	0	0			0	
Act Effct Green (s)	38.0		38.0		38.0	38.0		30.0			30.0	
Actuated g/C Ratio	0.48		0.48		0.48	0.48		0.38			0.38	
v/c Ratio	0.10		0.38		0.50	0.28		0.05			0.15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	12.6		2.8		16.9	2.6		16.1			12.8	
Queue Delay	0.0		0.0		0.0	0.0		0.0			0.0	
Total Delay	12.6		2.8		16.9	2.6		16.1			12.8	
LOS	B		A		B	A		B			B	
Approach Delay		3.7			11.7			16.1			12.8	
Approach LOS		A			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 9.7		Intersection LOS: A	
Intersection Capacity Utilization 71.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Queen St & Huron St

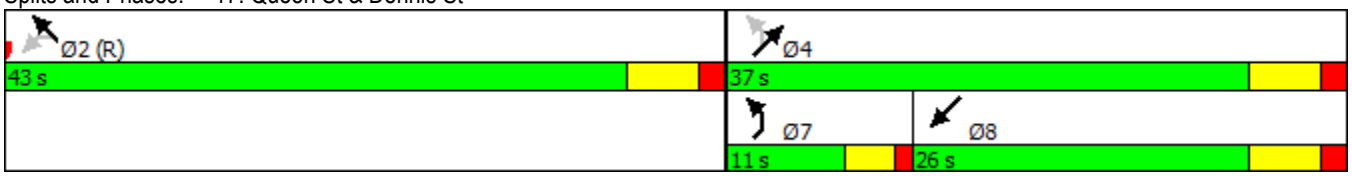


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	88	584	24	90	68	0	0	57	25
Future Volume (vph)	0	0	0	88	584	24	90	68	0	0	57	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	10.0		0.0	7.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor				0.99	1.00		0.94				0.97	
Frt					0.994						0.954	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1825	3547	0	1772	1847	0	0	3194	0
Flt Permitted				0.950			0.580					
Satd. Flow (perm)	0	0	0	1808	3547	0	1019	1847	0	0	3194	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					7						27	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		399.7			421.0			126.2			167.2	
Travel Time (s)		28.8			30.3			9.1			12.0	
Confl. Peds. (#/hr)				7		34	55					55
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
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	3%	4%	0%	0%	2%	16%
Adj. Flow (vph)	0	0	0	96	635	26	98	74	0	0	62	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	96	661	0	98	74	0	0	89	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					2		7	4			8	
Permitted Phases				2			4					
Minimum Split (s)				24.0	24.0		11.0	24.0			24.0	
Total Split (s)				43.0	43.0		11.0	37.0			26.0	
Total Split (%)				53.8%	53.8%		13.8%	46.3%			32.5%	
Maximum Green (s)				37.0	37.0		7.0	31.0			20.0	
Yellow Time (s)				4.3	4.3		3.0	4.3			4.3	
All-Red Time (s)				1.7	1.7		1.0	1.7			1.7	
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)				6.0	6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)				37.0	37.0		33.0	31.0			20.0	
Actuated g/C Ratio				0.46	0.46		0.41	0.39			0.25	
v/c Ratio				0.11	0.40		0.20	0.10			0.11	
Control Delay				15.9	16.7		26.1	35.9			17.5	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				15.9	16.7		26.1	35.9			17.5	
LOS				B	B		C	D			B	
Approach Delay					16.6			30.3			17.5	
Approach LOS					B			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 19.0		Intersection LOS: B	
Intersection Capacity Utilization 51.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 17: Queen St & Dennis St



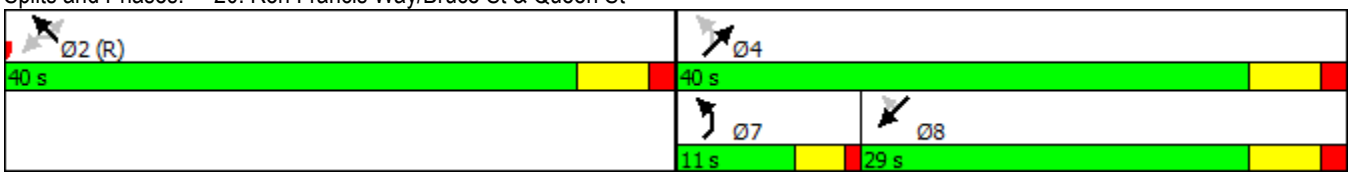
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	24	563	166	24	151	0	0	166	92
Future Volume (vph)	0	0	0	24	563	166	24	151	0	0	166	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	15.0		20.0	10.0		0.0	0.0		0.0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.97		0.94	0.98					0.96
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1755	3614	1617	1825	1902	0	0	1921	1585
Flt Permitted				0.950			0.540					
Satd. Flow (perm)	0	0	0	1703	3614	1515	1016	1902	0	0	1921	1519
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						159						100
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		421.0			395.0			183.9			166.9	
Travel Time (s)		30.3			28.4			13.2			12.0	
Confl. Peds. (#/hr)				22		39	23					23
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
Heavy Vehicles (%)	2%	2%	2%	4%	1%	1%	0%	1%	0%	0%	0%	3%
Adj. Flow (vph)	0	0	0	26	612	180	26	164	0	0	180	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	26	612	180	26	164	0	0	180	100
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					2		7	4			8	
Permitted Phases				2		2	4					8
Minimum Split (s)				24.0	24.0	24.0	11.0	24.0			24.0	24.0
Total Split (s)				40.0	40.0	40.0	11.0	40.0			29.0	29.0
Total Split (%)				50.0%	50.0%	50.0%	13.8%	50.0%			36.3%	36.3%
Maximum Green (s)				34.0	34.0	34.0	7.0	34.0			23.0	23.0
Yellow Time (s)				4.3	4.3	4.3	3.0	4.3			4.3	4.3
All-Red Time (s)				1.7	1.7	1.7	1.0	1.7			1.7	1.7
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				6.0	6.0	6.0	4.0	6.0			6.0	6.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0	0		0			0	0

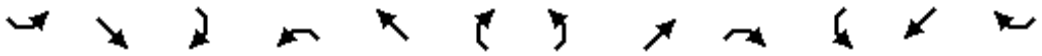
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)				34.0	34.0	34.0	36.0	34.0			23.0	23.0
Actuated g/C Ratio				0.42	0.42	0.42	0.45	0.42			0.29	0.29
v/c Ratio				0.04	0.40	0.24	0.05	0.20			0.33	0.20
Control Delay				20.7	21.8	10.0	9.5	11.0			24.4	6.0
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				20.7	21.8	10.0	9.5	11.0			24.4	6.0
LOS				C	C	A	A	B			C	A
Approach Delay					19.2			10.8			17.9	
Approach LOS					B			B			B	

Intersection Summary

Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 17.7		Intersection LOS: B	
Intersection Capacity Utilization 53.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 20: Ron Francis Way/Bruce St & Queen St



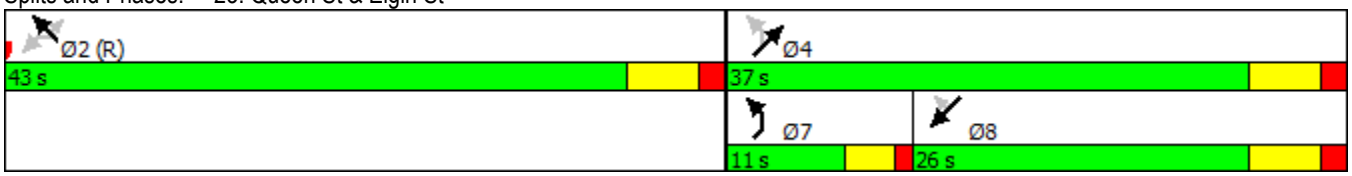


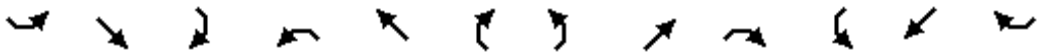
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	136	622	26	157	135	0	0	60	23
Future Volume (vph)	0	0	0	136	622	26	157	135	0	0	60	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	50.0		50.0	10.0		0.0	0.0		0.0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.99		0.96	0.98					0.97
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1807	3579	1570	1807	1902	0	0	1921	1570
Flt Permitted				0.950			0.596					
Satd. Flow (perm)	0	0	0	1795	3579	1506	1116	1902	0	0	1921	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95						95
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		395.0			353.4			117.3			174.7	
Travel Time (s)		28.4			25.4			8.4			12.6	
Confl. Peds. (#/hr)				3		22	14					14
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
Heavy Vehicles (%)	2%	2%	2%	1%	2%	4%	1%	1%	0%	0%	0%	4%
Adj. Flow (vph)	0	0	0	148	676	28	171	147	0	0	65	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	148	676	28	171	147	0	0	65	25
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					2		7	4			8	
Permitted Phases				2		2	4					8
Minimum Split (s)				24.0	24.0	24.0	11.0	24.0			24.0	24.0
Total Split (s)				43.0	43.0	43.0	11.0	37.0			26.0	26.0
Total Split (%)				53.8%	53.8%	53.8%	13.8%	46.3%			32.5%	32.5%
Maximum Green (s)				37.0	37.0	37.0	7.0	31.0			20.0	20.0
Yellow Time (s)				4.3	4.3	4.3	3.0	4.3			4.3	4.3
All-Red Time (s)				1.7	1.7	1.7	1.0	1.7			1.7	1.7
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				6.0	6.0	6.0	4.0	6.0			6.0	6.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0	0		0			0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)				37.0	37.0	37.0	33.0	31.0			20.0	20.0
Actuated g/C Ratio				0.46	0.46	0.46	0.41	0.39			0.25	0.25
v/c Ratio				0.18	0.41	0.04	0.33	0.20			0.14	0.06
Control Delay				13.3	15.2	0.1	16.1	19.2			24.3	0.2
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				13.3	15.2	0.1	16.1	19.2			24.3	0.2
LOS				B	B	A	B	B			C	A
Approach Delay					14.4			17.5			17.6	
Approach LOS					B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 54.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Queen St & Elgin St



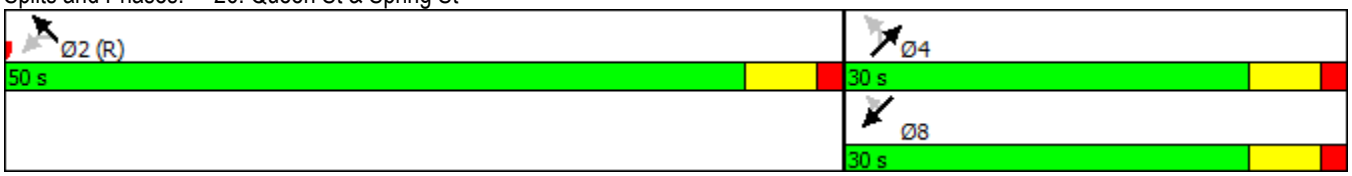


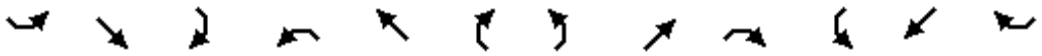
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	18	598	14	103	98	0	0	23	36
Future Volume (vph)	0	0	0	18	598	14	103	98	0	0	23	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	10.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.99					0.98
Frt					0.997							0.850
Flt Protected					0.999		0.950					
Satd. Flow (prot)	0	0	0	0	3565	0	1825	1921	0	0	1921	1585
Flt Permitted					0.999		0.741					
Satd. Flow (perm)	0	0	0	0	3562	0	1413	1921	0	0	1921	1554
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4							41
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		182.2			279.4			172.0			124.0	
Travel Time (s)		13.1			20.1			12.4			8.9	
Confl. Peds. (#/hr)				13		9	6					6
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
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	0	0	0	20	650	15	112	107	0	0	25	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	685	0	112	107	0	0	25	39
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					2			4			8	
Permitted Phases				2			4					8
Minimum Split (s)				24.0	24.0		24.0	24.0			24.0	24.0
Total Split (s)				50.0	50.0		30.0	30.0			30.0	30.0
Total Split (%)				62.5%	62.5%		37.5%	37.5%			37.5%	37.5%
Maximum Green (s)				44.0	44.0		24.0	24.0			24.0	24.0
Yellow Time (s)				4.3	4.3		4.3	4.3			4.3	4.3
All-Red Time (s)				1.7	1.7		1.7	1.7			1.7	1.7
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)					6.0		6.0	6.0			6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0		11.0	11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0		0	0			0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)					44.0		24.0	24.0			24.0	24.0
Actuated g/C Ratio					0.55		0.30	0.30			0.30	0.30
v/c Ratio					0.35		0.26	0.19			0.04	0.08
Control Delay					9.8		23.5	22.3			20.3	7.2
Queue Delay					0.0		0.0	0.0			0.0	0.0
Total Delay					9.8		23.5	22.3			20.3	7.2
LOS					A		C	C			C	A
Approach Delay					9.8			22.9			12.3	
Approach LOS					A			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.35			
Intersection Signal Delay: 12.9		Intersection LOS: B	
Intersection Capacity Utilization 62.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 26: Queen St & Spring St





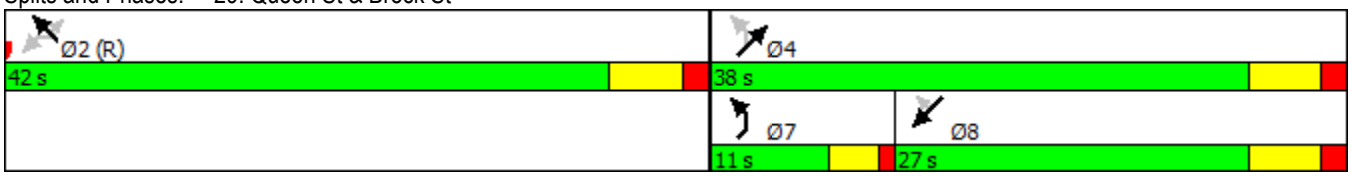
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	95	548	38	33	71	0	0	70	57
Future Volume (vph)	0	0	0	95	548	38	33	71	0	0	70	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	20.0		13.0	10.0		0.0	0.0		0.0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.93		0.91	0.99					0.97
Frt						0.850						0.850
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	0	0	1772	3544	1633	1825	1921	0	0	1902	1601
Flt Permitted				0.950			0.594					
Satd. Flow (perm)	0	0	0	1642	3544	1481	1124	1921	0	0	1902	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95						95
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		279.4			414.3			129.8			110.9	
Travel Time (s)		20.1			29.8			9.3			8.0	
Confl. Peds. (#/hr)				33		62	14					14
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	0%	0%	0%	0%	0%	1%	2%
Adj. Flow (vph)	0	0	0	103	596	41	36	77	0	0	76	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	103	596	41	36	77	0	0	76	62
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					2		7	4			8	
Permitted Phases				2		2	4					8
Minimum Split (s)				24.0	24.0	24.0	11.0	24.0			24.0	24.0
Total Split (s)				42.0	42.0	42.0	11.0	38.0			27.0	27.0
Total Split (%)				52.5%	52.5%	52.5%	13.8%	47.5%			33.8%	33.8%
Maximum Green (s)				36.0	36.0	36.0	7.0	32.0			21.0	21.0
Yellow Time (s)				4.3	4.3	4.3	3.0	4.3			4.3	4.3
All-Red Time (s)				1.7	1.7	1.7	1.0	1.7			1.7	1.7
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				6.0	6.0	6.0	4.0	6.0			6.0	6.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0	11.0		11.0			11.0	11.0
Pedestrian Calls (#/hr)				0	0	0		0			0	0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)				36.0	36.0	36.0	34.0	32.0			21.0	21.0
Actuated g/C Ratio				0.45	0.45	0.45	0.42	0.40			0.26	0.26
v/c Ratio				0.14	0.37	0.06	0.07	0.10			0.15	0.13
Control Delay				22.1	23.0	5.6	11.3	12.2			23.7	3.0
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				22.1	23.0	5.6	11.3	12.2			23.7	3.0
LOS				C	C	A	B	B			C	A
Approach Delay					21.9			11.9			14.4	
Approach LOS					C			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NWTL and 6:, Start of Green
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.37
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 64.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 29: Queen St & Brock St

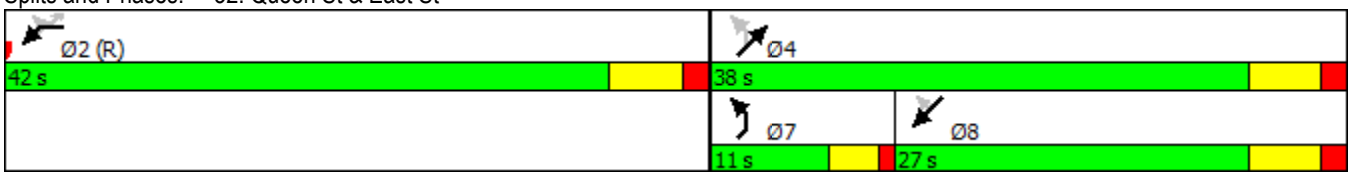


Lane Group	WBL	WBR	WBR2	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	63	549	58	0	0	97	110	0	0	27	28
Future Volume (vph)	63	549	58	0	0	97	110	0	0	27	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0	40.0		0.0	0.0	10.0		0.0	0.0		0.0
Storage Lanes	1	1		0	0	0		0	0		1
Taper Length (m)	7.6			7.6		7.6			7.6		
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95		0.90			0.98					0.97
Frt		0.850	0.850								0.850
Flt Protected	0.950					0.950					
Satd. Flow (prot)	1690	2790	1633	0	0	1825	1865	0	0	1795	1633
Flt Permitted	0.950					0.620					
Satd. Flow (perm)	1607	2790	1472	0	0	1169	1865	0	0	1795	1579
Right Turn on Red			Yes		Yes			Yes			Yes
Satd. Flow (RTOR)			95								95
Link Speed (k/h)	50			50			50			50	
Link Distance (m)	482.4			414.3			126.8			174.2	
Travel Time (s)	34.7			29.8			9.1			12.5	
Confl. Peds. (#/hr)	22		36			16					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
Heavy Vehicles (%)	8%	3%	0%	2%	2%	0%	3%	0%	0%	7%	0%
Adj. Flow (vph)	68	597	63	0	0	105	120	0	0	29	30
Shared Lane Traffic (%)											
Lane Group Flow (vph)	68	597	63	0	0	105	120	0	0	29	30
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.7			3.7			3.7			3.7	
Link Offset(m)	0.0			0.0			0.0			0.0	
Crosswalk Width(m)	4.9			4.9			4.9			4.9	
Two way Left Turn Lane											
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14	14	24	14	24		14	24		14
Turn Type	Prot	Perm	Perm			pm+pt	NA			NA	Perm
Protected Phases	2					7	4			8	
Permitted Phases		2	2			4					8
Minimum Split (s)	24.0	24.0	24.0			11.0	24.0			24.0	24.0
Total Split (s)	42.0	42.0	42.0			11.0	38.0			27.0	27.0
Total Split (%)	52.5%	52.5%	52.5%			13.8%	47.5%			33.8%	33.8%
Maximum Green (s)	36.0	36.0	36.0			7.0	32.0			21.0	21.0
Yellow Time (s)	4.3	4.3	4.3			3.0	4.3			4.3	4.3
All-Red Time (s)	1.7	1.7	1.7			1.0	1.7			1.7	1.7
Lost Time Adjust (s)	0.0	0.0	0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0			4.0	6.0			6.0	6.0
Lead/Lag						Lead				Lag	Lag
Lead-Lag Optimize?						Yes				Yes	Yes
Walk Time (s)	7.0	7.0	7.0				7.0			7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0				11.0			11.0	11.0
Pedestrian Calls (#/hr)	0	0	0				0			0	0

Lane Group	WBL	WBR	WBR2	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)	36.0	36.0	36.0			34.0	32.0			21.0	21.0
Actuated g/C Ratio	0.45	0.45	0.45			0.42	0.40			0.26	0.26
v/c Ratio	0.09	0.48	0.09			0.19	0.16			0.06	0.06
Control Delay	10.4	14.7	3.2			14.0	14.6			22.7	0.2
Queue Delay	0.0	0.0	0.0			0.0	0.0			0.0	0.0
Total Delay	10.4	14.7	3.2			14.0	14.6			22.7	0.2
LOS	B	B	A			B	B			C	A
Approach Delay	13.3						14.3			11.3	
Approach LOS	B						B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:WBL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 13.4		Intersection LOS: B	
Intersection Capacity Utilization 74.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 32: Queen St & East St



Lane Group	WBL	WBR	SEL2	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Traffic Volume (vph)	0	0	68	917	26	0	36	24	52	24	0
Future Volume (vph)	0	0	68	917	26	0	36	24	52	24	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	0.0	0.0		0.0	10.0		0.0
Storage Lanes	0	0		4	0	0		0	1		0
Taper Length (m)	2.5			2.5		2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.99	1.00			0.99		0.99		
Frt				0.996			0.946				
Flt Protected			0.950	0.954					0.950		
Satd. Flow (prot)	0	0	1772	5095	0	0	1742	0	1706	1921	0
Flt Permitted			0.950	0.954					0.715		
Satd. Flow (perm)	0	0	1758	5095	0	0	1742	0	1271	1921	0
Right Turn on Red					Yes			Yes			Yes
Satd. Flow (RTOR)				41			26				
Link Speed (k/h)	50			50			50			50	
Link Distance (m)	463.6			477.7			112.4			142.9	
Travel Time (s)	33.4			34.4			8.1			10.3	
Confl. Peds. (#/hr)			6		1			8	8		
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
Heavy Vehicles (%)	0%	0%	3%	1%	0%	0%	3%	4%	7%	0%	0%
Adj. Flow (vph)	0	0	74	997	28	0	39	26	57	26	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	0	0	74	1025	0	0	65	0	57	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0			14.8			3.7			3.7	
Link Offset(m)	0.0			0.0			0.0			0.0	
Crosswalk Width(m)	1.6			1.6			1.6			1.6	
Two way Left Turn Lane											
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14	24	24	14	24		14	24		14
Turn Type			Perm	Prot			NA		Perm	NA	
Protected Phases				6			4			8	
Permitted Phases			6						8		
Minimum Split (s)			26.0	26.0			27.0		27.0	27.0	
Total Split (s)			48.0	48.0			32.0		32.0	32.0	
Total Split (%)			60.0%	60.0%			40.0%		40.0%	40.0%	
Maximum Green (s)			42.0	42.0			26.0		26.0	26.0	
Yellow Time (s)			4.3	4.3			4.3		4.3	4.3	
All-Red Time (s)			1.7	1.7			1.7		1.7	1.7	
Lost Time Adjust (s)			0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)			6.0	6.0			6.0		6.0	6.0	
Lead/Lag											
Lead-Lag Optimize?											
Walk Time (s)			7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)			11.0	11.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)			0	0			0		0	0	

Lane Group	WBL	WBR	SEL2	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)			42.0	42.0			26.0		26.0	26.0	
Actuated g/C Ratio			0.52	0.52			0.32		0.32	0.32	
v/c Ratio			0.08	0.38			0.11		0.14	0.04	
Control Delay			11.7	12.6			13.4		22.6	21.3	
Queue Delay			0.0	0.0			0.0		0.0	0.0	
Total Delay			11.7	12.6			13.4		22.6	21.3	
LOS			B	B			B		C	C	
Approach Delay				12.5			13.4			22.2	
Approach LOS				B			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SEL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.38			
Intersection Signal Delay: 13.2		Intersection LOS: B	
Intersection Capacity Utilization 74.8%		ICU Level of Service D	
Analysis Period (min) 15			

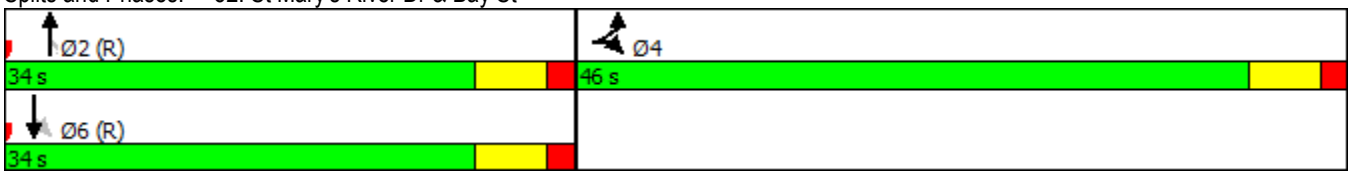
Splits and Phases: 43: East St & Bay St

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Lane Configurations											
Traffic Volume (vph)	21	467	102	0	207	25	96	86	0	0	0
Future Volume (vph)	21	467	102	0	207	25	96	86	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.96	0.98				
Frt		0.850				0.850					
Flt Protected	0.950						0.950				
Satd. Flow (prot)	1789	2800	0	0	1883	1570	1789	1883	0	0	0
Flt Permitted	0.950						0.586				
Satd. Flow (perm)	1789	2800	0	0	1883	1508	1082	1883	0	0	0
Right Turn on Red			Yes			Yes			Yes		Yes
Satd. Flow (RTOR)		41				41					
Link Speed (k/h)	50				50			50		50	
Link Distance (m)	835.3				175.6			41.0		32.8	
Travel Time (s)	60.1				12.6			3.0		2.4	
Confl. Peds. (#/hr)			3			21	21				
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
Heavy Vehicles (%)	2%	3%	1%	2%	2%	4%	2%	2%	2%	2%	2%
Adj. Flow (vph)	23	508	111	0	225	27	104	93	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	23	619	0	0	225	27	104	93	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Right
Median Width(m)	3.7				3.7			3.7		0.0	
Link Offset(m)	0.0				0.0			0.0		0.0	
Crosswalk Width(m)	1.6				1.6			1.6		1.6	
Two way Left Turn Lane											
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14	14	24		14	24		14	24	14
Turn Type	Prot	Prot			NA	Perm	Perm	NA			
Protected Phases	4	4			2			6			
Permitted Phases						2	6				
Minimum Split (s)	24.0	24.0			24.0	24.0	24.0	24.0			
Total Split (s)	46.0	46.0			34.0	34.0	34.0	34.0			
Total Split (%)	57.5%	57.5%			42.5%	42.5%	42.5%	42.5%			
Maximum Green (s)	40.0	40.0			28.0	28.0	28.0	28.0			
Yellow Time (s)	4.3	4.3			4.3	4.3	4.3	4.3			
All-Red Time (s)	1.7	1.7			1.7	1.7	1.7	1.7			
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0			
Total Lost Time (s)	6.0	6.0			6.0	6.0	6.0	6.0			
Lead/Lag											
Lead-Lag Optimize?											
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0			
Flash Dont Walk (s)	11.0	11.0			11.0	11.0	11.0	11.0			
Pedestrian Calls (#/hr)	0	0			0	0	0	0			
Act Effct Green (s)	40.0	40.0			28.0	28.0	28.0	28.0			
Actuated g/C Ratio	0.50	0.50			0.35	0.35	0.35	0.35			
v/c Ratio	0.03	0.44			0.34	0.05	0.28	0.14			

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR
Control Delay	10.3	13.0			21.0	4.1	21.2	18.6			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0			
Total Delay	10.3	13.0			21.0	4.1	21.2	18.6			
LOS	B	B			C	A	C	B			
Approach Delay	12.9				19.2			20.0			
Approach LOS	B				B			B			

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 64.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 52: St Mary's River Dr & Bay St

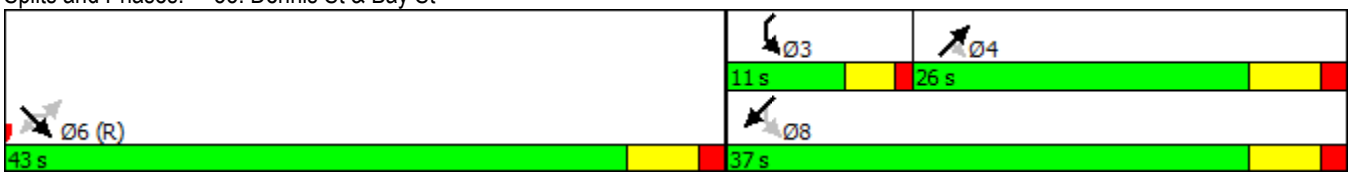


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	34	539	42	0	0	0	0	100	75	44	93	0
Future Volume (vph)	34	539	42	0	0	0	0	100	75	44	93	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		30.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	0		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97						0.97	0.98		
Frt			0.850						0.850			
Flt Protected		0.997								0.950		
Satd. Flow (prot)	0	6504	1601	0	0	0	0	1847	1617	1825	1883	0
Flt Permitted		0.997								0.572		
Satd. Flow (perm)	0	6504	1555	0	0	0	0	1847	1566	1082	1883	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95						95			
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		391.5			415.0			76.5			153.4	
Travel Time (s)		28.2			29.9			5.5			11.0	
Confl. Peds. (#/hr)			4						15	15		
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
Heavy Vehicles (%)	6%	1%	2%	2%	2%	2%	2%	4%	1%	0%	2%	2%
Adj. Flow (vph)	37	586	46	0	0	0	0	109	82	48	101	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	623	46	0	0	0	0	109	82	48	101	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		6						4		3	8	
Permitted Phases	6		6						4	8		
Minimum Split (s)	24.0	24.0	24.0					24.0	24.0	11.0	24.0	
Total Split (s)	43.0	43.0	43.0					26.0	26.0	11.0	37.0	
Total Split (%)	53.8%	53.8%	53.8%					32.5%	32.5%	13.8%	46.3%	
Maximum Green (s)	37.0	37.0	37.0					20.0	20.0	7.0	31.0	
Yellow Time (s)	4.3	4.3	4.3					4.3	4.3	3.0	4.3	
All-Red Time (s)	1.7	1.7	1.7					1.7	1.7	1.0	1.7	
Lost Time Adjust (s)		0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0					6.0	6.0	4.0	6.0	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0	11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0	0					0	0		0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)		37.0	37.0					20.0	20.0	33.0	31.0	
Actuated g/C Ratio		0.46	0.46					0.25	0.25	0.41	0.39	
v/c Ratio		0.21	0.06					0.24	0.18	0.09	0.14	
Control Delay		13.0	0.6					25.6	5.6	14.2	24.1	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		13.0	0.6					25.6	5.6	14.2	24.1	
LOS		B	A					C	A	B	C	
Approach Delay		12.1						17.0			20.9	
Approach LOS		B						B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.24			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 51.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 55: Dennis St & Bay St



Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	118	590	0	0	253	0
Future Volume (vph)	118	590	0	0	253	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.86	1.00	1.00	0.97	1.00
Ped Bike Factor					1.00	
Frt						
Flt Protected		0.992			0.950	
Satd. Flow (prot)	0	6344	0	0	3506	0
Flt Permitted		0.992			0.950	
Satd. Flow (perm)	0	6344	0	0	3501	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						
Link Speed (k/h)		50	50		50	
Link Distance (m)		415.0	398.0		94.8	
Travel Time (s)		29.9	28.7		6.8	
Confl. Peds. (#/hr)					1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	3%	0%	0%	1%	0%
Adj. Flow (vph)	128	641	0	0	275	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	769	0	0	275	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		7.4	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24			14	24	14
Turn Type	Perm	NA			Prot	
Protected Phases		6			8	
Permitted Phases	6					
Minimum Split (s)	24.0	24.0			24.0	
Total Split (s)	46.0	46.0			34.0	
Total Split (%)	57.5%	57.5%			42.5%	
Maximum Green (s)	40.0	40.0			28.0	
Yellow Time (s)	4.3	4.3			4.3	
All-Red Time (s)	1.7	1.7			1.7	
Lost Time Adjust (s)		0.0			0.0	
Total Lost Time (s)		6.0			6.0	
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0	7.0			7.0	
Flash Dont Walk (s)	11.0	11.0			11.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)		40.0			28.0	
Actuated g/C Ratio		0.50			0.35	
v/c Ratio		0.24			0.22	

Lane Group	SEL	SET	NWT	NWR	SWL	SWR
Control Delay		9.6			26.4	
Queue Delay		0.0			0.0	
Total Delay		9.6			26.4	
LOS		A			C	
Approach Delay		9.6			26.4	
Approach LOS		A			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.24			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 86.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 57: Bay St & Ron Francis Way

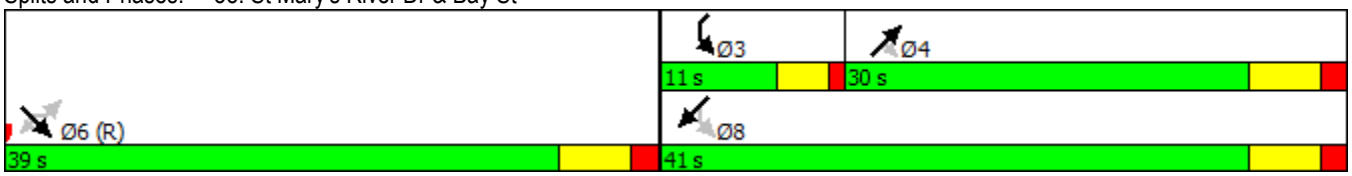
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	69	835	81	0	0	0	0	129	81	30	94	0
Future Volume (vph)	69	835	81	0	0	0	0	129	81	30	94	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		50.0	0.0		0.0	0.0		0.0	10.0		0.0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97						0.97	0.99		
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1807	5142	1570	0	0	0	0	1902	1601	1825	1902	0
Flt Permitted	0.950									0.572		
Satd. Flow (perm)	1807	5142	1518	0	0	0	0	1902	1550	1083	1902	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95						95			
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		398.0			530.2			91.8			164.0	
Travel Time (s)		28.7			38.2			6.6			11.8	
Confl. Peds. (#/hr)			6						15	15		
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
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%	0%	1%	2%	0%	1%	0%
Adj. Flow (vph)	75	908	88	0	0	0	0	140	88	33	102	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	908	88	0	0	0	0	140	88	33	102	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		6						4		3	8	
Permitted Phases	6		6						4	8		
Minimum Split (s)	25.0	25.0	25.0					27.0	27.0	11.0	27.0	
Total Split (s)	39.0	39.0	39.0					30.0	30.0	11.0	41.0	
Total Split (%)	48.8%	48.8%	48.8%					37.5%	37.5%	13.8%	51.3%	
Maximum Green (s)	33.0	33.0	33.0					24.0	24.0	7.0	35.0	
Yellow Time (s)	4.3	4.3	4.3					4.3	4.3	3.0	4.3	
All-Red Time (s)	1.7	1.7	1.7					1.7	1.7	1.0	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0					6.0	6.0	4.0	6.0	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0	11.0					11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0	0					0	0		0	

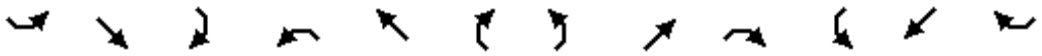
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)	33.0	33.0	33.0					24.0	24.0	37.0	35.0	
Actuated g/C Ratio	0.41	0.41	0.41					0.30	0.30	0.46	0.44	
v/c Ratio	0.10	0.43	0.13					0.25	0.17	0.06	0.12	
Control Delay	11.8	14.0	4.9					22.6	5.3	14.9	22.5	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	11.8	14.0	4.9					22.6	5.3	14.9	22.5	
LOS	B	B	A					C	A	B	C	
Approach Delay		13.1						15.9			20.6	
Approach LOS		B						B			C	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green
Natural Cycle: 65
Control Type: Pretimed
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 54.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 58: St Mary's River Dr & Bay St





Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	160	1034	23	0	0	0	0	45	32	20	22	0
Future Volume (vph)	160	1034	23	0	0	0	0	45	32	20	22	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		5.0	10.0		0.0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.98	1.00		
Frt		0.997							0.850			
Flt Protected		0.993								0.950		
Satd. Flow (prot)	0	6482	0	0	0	0	0	1921	1633	1825	1762	0
Flt Permitted		0.993								0.725		
Satd. Flow (perm)	0	6480	0	0	0	0	0	1921	1605	1386	1762	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8							41			
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		530.2			275.3			91.5			95.4	
Travel Time (s)		38.2			19.8			6.6			6.9	
Confl. Peds. (#/hr)	1		13						4	4		
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
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%
Adj. Flow (vph)	174	1124	25	0	0	0	0	49	35	22	24	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1323	0	0	0	0	0	49	35	22	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA						NA	Perm	Perm	NA	
Protected Phases		6						4			8	
Permitted Phases	6								4	8		
Minimum Split (s)	27.0	27.0						24.0	24.0	24.0	24.0	
Total Split (s)	56.0	56.0						24.0	24.0	24.0	24.0	
Total Split (%)	70.0%	70.0%						30.0%	30.0%	30.0%	30.0%	
Maximum Green (s)	50.0	50.0						18.0	18.0	18.0	18.0	
Yellow Time (s)	4.3	4.3						4.3	4.3	4.3	4.3	
All-Red Time (s)	1.7	1.7						1.7	1.7	1.7	1.7	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0						6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0						7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0						0	0	0	0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)		50.0						18.0	18.0	18.0	18.0	
Actuated g/C Ratio		0.62						0.22	0.22	0.22	0.22	
v/c Ratio		0.33						0.11	0.09	0.07	0.06	
Control Delay		6.7						25.6	8.2	16.2	16.2	
Queue Delay		0.0						0.0	0.0	0.0	0.0	
Total Delay		6.7						25.6	8.2	16.2	16.2	
LOS		A						C	A	B	B	
Approach Delay		6.7						18.3			16.2	
Approach LOS		A						B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 7.7		Intersection LOS: A	
Intersection Capacity Utilization 62.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 60: Spring St & Bay St

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	65	981	12	0	0	0	0	25	107	47	47	0
Future Volume (vph)	65	981	12	0	0	0	0	25	107	47	47	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	10.0		0.0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.98	0.99		
Frt		0.998							0.850			
Flt Protected		0.997								0.950		
Satd. Flow (prot)	0	6512	0	0	0	0	0	1921	1585	1825	1847	0
Flt Permitted		0.997								0.740		
Satd. Flow (perm)	0	6503	0	0	0	0	0	1921	1556	1412	1847	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4							69			
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		275.3			477.7			103.0			137.3	
Travel Time (s)		19.8			34.4			7.4			9.9	
Confl. Peds. (#/hr)	10		10						5	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
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	3%	0%	4%	0%
Adj. Flow (vph)	71	1066	13	0	0	0	0	27	116	51	51	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1150	0	0	0	0	0	27	116	51	51	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Turn Type	Perm	NA						NA	Perm	Perm	NA	
Protected Phases		6						4			8	
Permitted Phases	6								4	8		
Minimum Split (s)	27.0	27.0						25.0	25.0	25.0	25.0	
Total Split (s)	48.0	48.0						32.0	32.0	32.0	32.0	
Total Split (%)	60.0%	60.0%						40.0%	40.0%	40.0%	40.0%	
Maximum Green (s)	42.0	42.0						26.0	26.0	26.0	26.0	
Yellow Time (s)	4.3	4.3						4.3	4.3	4.3	4.3	
All-Red Time (s)	1.7	1.7						1.7	1.7	1.7	1.7	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0						6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0						7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0						11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0						0	0	0	0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Act Effct Green (s)		42.0						26.0	26.0	26.0	26.0	
Actuated g/C Ratio		0.52						0.32	0.32	0.32	0.32	
v/c Ratio		0.34						0.04	0.21	0.11	0.09	
Control Delay		12.3						18.8	10.4	24.6	24.1	
Queue Delay		0.0						0.0	0.0	0.0	0.0	
Total Delay		12.3						18.8	10.4	24.6	24.1	
LOS		B						B	B	C	C	
Approach Delay		12.3						12.0			24.3	
Approach LOS		B						B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2: and 6:SETL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.34			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 64.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 62: Foster Dr/Brock St & Bay St

Appendix C – Signal Warrants for One-Way Operation

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Gore Street at Bay Street Count Date: 2017-10-03

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	723	757	869	909	834	1,004	961	794		
	COMPLIANCE %				80	84	97	100	93	100	100	88	742	93
1B	120	170	120	170	202	373	416	418	364	414	441	337		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
Restricted Flow Signal Justification 1:					**Both 1A and 1B 100% Fullfilled each of 8 hours** Yes ☐ No ☑ **Lesser of 1A or 1B at least 80% fulfilled each of 8 hours** Yes ☑ No ☐									

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	426	271	299	346	345	467	401	368		
	COMPLIANCE %				47	30	33	38	38	52	45	41	325	41
2B	50	75	50	75	175	270	331	300	262	323	369	255		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
Restricted Flow Signal Justification 2:					**Both 2A and 2B 100% Fullfilled each of 8 hours** Yes ☐ No ☑ **Lesser of 2A or 2B at least 80% fulfilled each of 8 hours** Yes ☐ No ☑									

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	16:00	590	232	392	59 %	54 %
	17:00	520	297	436	68 %	
	13:00	491	214	455	47 %	
	12:00	453	210	482	44 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Dennis Street at Bay Street Count Date: 2017-10-12

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	656	656	788	783	819	818	929	872		
	COMPLIANCE %				73	73	88	87	91	91	100	97	699	87
1B	120	170	120	170	103	200	274	253	288	238	314	355		
	COMPLIANCE %				61	100	100	100	100	100	100	100	761	95
Restricted Flow **Signal Justification 1:**					**Both 1A and 1B 100% Fullfilled each of 8 hours** Yes ☐ No ☑ **Lesser of 1A or 1B at least 80% fulfilled each of 8 hours** Yes ☑ No ☐									

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	513	391	433	468	460	519	539	449		
	COMPLIANCE %				57	43	48	52	51	58	60	50	419	52
2B	50	75	50	75	108	136	172	167	178	142	185	248		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
Restricted Flow **Signal Justification 2:**					**Both 2A and 2B 100% Fullfilled each of 8 hours** Yes ☐ No ☑ **Lesser of 2A or 2B at least 80% fulfilled each of 8 hours** Yes ☐ No ☑									

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	17:00	615	176	377	47 %	44 %
	18:00	517	264	438	60 %	
	15:00	531	150	429	35 %	
	16:00	580	142	398	36 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Ron Francis Way at Bay Street Count Date: 2017-10-17

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	824	769	1,043	1,012	822	961	907	840		
	COMPLIANCE %				92	85	100	100	91	100	100	93	762	95
1B	120	170	120	170	292	292	339	367	330	253	245	220		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow Signal Justification 1:

Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☐ No ☑

Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	479	390	570	525	473	590	526	504		
	COMPLIANCE %				53	43	63	58	53	66	58	56	451	56
2B	50	75	50	75	300	300	347	375	338	261	253	228		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow Signal Justification 2:

Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑

Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	12:00	704	339	326	100 %	87 %
	13:00	645	367	359	100 %	
	16:00	708	253	324	78 %	
	17:00	662	245	349	70 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Elgin Street at Bay Street Count Date: 2017-10-19

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	1,046	1,070	1,200	1,297	1,120	1,319	1,106	1,010		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	120	170	120	170	288	298	372	371	296	334	320	265		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 1:

Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☑ No ☐
Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	597	652	683	768	686	835	622	603		
	COMPLIANCE %				66	72	76	85	76	93	69	67	605	76
2B	50	75	50	75	239	187	239	220	180	181	177	133		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 2:

Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	16:00	985	210	200	100 %	83 %
	13:00	926	198	222	89 %	
	12:00	828	217	264	82 %	
	14:00	824	158	266	59 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Spring Street at Bay Street Count Date: 2017-10-26

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	633	730	975	869	855	974	1,196	1,064		
	COMPLIANCE %				70	81	100	97	95	100	100	100	743	93
1B	120	170	120	170	39	53	98	72	63	60	125	75		
	COMPLIANCE %				23	31	58	42	37	35	74	44	344	43

Restricted Flow
Signal Justification 1:

Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	540	586	767	696	712	819	909	852		
	COMPLIANCE %				60	65	85	77	79	91	100	95	652	82
2B	50	75	50	75	50	56	60	68	62	57	84	51		
	COMPLIANCE %				67	75	80	91	83	76	100	68	639	80

Restricted Flow
Signal Justification 2:

Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☐	NO ☑	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☑	NO ☐		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	17:00	1,071	74	171	43 %	27 %
	18:00	989	48	198	24 %	
	12:00	877	53	242	22 %	
	16:00	914	44	227	19 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Spring Street at Bay Street Count Date: 2017-11-01

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	749	896	1,167	978	1,005	1,122	1,251	878		
	COMPLIANCE %				83	100	100	100	100	100	100	98	780	98
1B	120	170	120	170	190	226	289	221	218	219	256	121		
	COMPLIANCE %				100	100	100	100	100	100	100	71	771	96

Restricted Flow	**Both 1A and 1B 100% Fullfilled each of 8 hours**	**Yes** ☐	**No** ☑
Signal Justification 1:	**Lesser of 1A or 1B at least 80% fulfilled each of 8 hours**	**Yes** ☑	**No** ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	440	537	710	628	649	797	920	700		
	COMPLIANCE %				49	60	79	70	72	89	100	78	596	74
2B	50	75	50	75	140	138	172	139	139	116	123	76		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow	**Both 2A and 2B 100% Fullfilled each of 8 hours**	**Yes** ☐	**No** ☑
Signal Justification 2:	**Lesser of 2A or 2B at least 80% fulfilled each of 8 hours**	**Yes** ☐	**No** ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	17:00	995	149	196	76 %	59 %
	13:00	878	156	242	64 %	
	16:00	903	119	231	51 %	
	15:00	787	123	283	43 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: East Street at Bay Street Count Date: 2017-11-07

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	579	723	939	805	931	1,007	1,142	915		
	COMPLIANCE %				64	80	100	89	100	100	100	100	734	92
1B	120	170	120	170	118	124	153	169	156	146	154	115		
	COMPLIANCE %				69	73	90	99	92	86	91	68	668	83
Restricted Flow **Signal Justification 1:**					Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☐ No ☑									
					Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐									

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	360	480	654	498	633	729	890	712		
	COMPLIANCE %				40	53	73	55	70	81	99	79	551	69
2B	50	75	50	75	88	94	104	116	121	100	114	83		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
Restricted Flow **Signal Justification 2:**					Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑									
					Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑									

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	17:00	988	87	199	44 %	33 %
	16:00	861	79	249	32 %	
	12:00	786	83	284	29 %	
	14:00	775	81	289	28 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Huron Street at Queen Street Count Date: 2017-09-20

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	714	883	1,075	1,024	1,002	1,048	1,175	1,083		
	COMPLIANCE %				79	98	100	100	100	100	100	100	777	97
1B	120	170	120	170	177	244	277	243	270	259	231	196		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow Signal Justification 1:	Both 1A and 1B 100% Fullfilled each of 8 hours	Yes ☐	No ☑
	Lesser of 1A or 1B at least 80% fulfilled each of 8 hours	Yes ☑	No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	0	0	0	0	0	0	0	0		
	COMPLIANCE %				0	0	0	0	0	0	0	0	0	0
2B	50	75	50	75	141	188	211	188	206	196	164	153		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow Signal Justification 2:	Both 2A and 2B 100% Fullfilled each of 8 hours	Yes ☐	No ☑
	Lesser of 2A or 2B at least 80% fulfilled each of 8 hours	Yes ☐	No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	17:00	944	180	215	84 %	79 %
	18:00	887	170	238	71 %	
	12:00	798	232	278	83 %	
	16:00	789	222	282	79 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Gore Street at Queen Street Count Date: 2017-08-29

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	568	697	896	785	823	876	1,141	939		
	COMPLIANCE %				63	77	100	87	91	97	100	100	716	90
1B	120	170	120	170	147	186	314	264	248	286	321	294		
	COMPLIANCE %				86	100	100	100	100	100	100	100	786	98

Restricted Flow
Signal Justification 1:

Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	260	340	370	340	373	378	561	491		
	COMPLIANCE %				29	38	41	38	41	42	62	55	346	43
2B	50	75	50	75	155	194	322	272	256	294	329	302		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 2:

Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	17:00	820	321	268	100 %	84 %
	18:00	645	294	359	82 %	
	12:00	582	314	397	79 %	
	16:00	590	286	392	73 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Dennis Street at Queen Street Count Date: 2017-08-29

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	618	783	860	971	873	847	906	814		
	COMPLIANCE %				69	87	96	100	97	94	100	90	733	92
1B	120	170	120	170	192	207	251	256	244	242	234	202		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow Signal Justification 1:

Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☐ No ☑

Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	332	455	470	514	484	484	547	518		
	COMPLIANCE %				37	51	52	57	54	54	61	58	423	53
2B	50	75	50	75	169	172	213	206	190	199	203	175		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow Signal Justification 2:

Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑

Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	13:00	715	152	320	47 %	42 %
	17:00	672	158	344	46 %	
	14:00	629	145	368	39 %	
	12:00	609	138	380	36 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Bruce Street at Queen Street Count Date: 2017-08-23

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	837	1,021	1,206	1,227	1,077	1,091	1,147	1,805		
	COMPLIANCE %				93	100	100	100	100	100	100	100	793	99
1B	120	170	120	170	359	422	566	551	476	455	421	1,196		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 1:

Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	352	452	470	525	482	499	540	497		
	COMPLIANCE %				39	50	52	58	54	55	60	55	424	53
2B	50	75	50	75	221	257	337	332	256	235	214	193		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 2:

Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	18:00	609	1,053	380	100 %	96 %
	14:00	676	417	341	100 %	
	13:00	640	409	362	100 %	
	17:00	726	260	314	83 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Elgin Street at Queen Street Count Date: 2017-08-17

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	691	829	1,001	997	886	945	1,152	797		
	COMPLIANCE %				77	92	100	100	98	100	100	89	756	94
1B	120	170	120	170	181	251	291	307	252	311	367	233		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
Restricted Flow **Signal Justification 1:**					Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☐ No ☑									
					Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐									

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	331	426	470	476	452	452	604	454		
	COMPLIANCE %				37	47	52	53	50	50	67	50	407	51
2B	50	75	50	75	163	188	211	243	205	243	308	218		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
Restricted Flow **Signal Justification 2:**					Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑									
					Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑									

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	17:00	785	273	284	96 %	67 %
	13:00	710	164	323	51 %	
	14:00	690	208	334	62 %	
	16:00	634	208	365	57 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Spring Street at Queen Street Count Date: 2017-08-17

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	705	677	886	833	709	726	883	669		
	COMPLIANCE %				78	75	98	93	79	81	98	74	676	85
1B	120	170	120	170	137	121	202	165	143	173	262	155		
	COMPLIANCE %				81	71	100	97	84	100	100	91	724	91
Restricted Flow **Signal Justification 1:**					**Both 1A and 1B 100% Fullfilled each of 8 hours** Yes ☐ No ☑ **Lesser of 1A or 1B at least 80% fulfilled each of 8 hours** Yes ☑ No ☐									

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	487	506	625	588	501	503	582	477		
	COMPLIANCE %				54	56	69	65	56	56	65	53	474	59
2B	50	75	50	75	102	79	113	101	91	110	205	122		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
Restricted Flow **Signal Justification 2:**					**Both 2A and 2B 100% Fullfilled each of 8 hours** Yes ☐ No ☑ **Lesser of 2A or 2B at least 80% fulfilled each of 8 hours** Yes ☐ No ☑									

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	13:00	684	107	337	32 %	35 %
	17:00	621	200	373	54 %	
	14:00	668	96	346	28 %	
	16:00	553	105	415	25 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Brock Street at Queen Street Count Date: 2017-08-15

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	10:00	12:00	13:00	14:00	15:00	16:00	17:00		
1A	480	720	600	900	894	777	865	1,069	1,061	953	867	854		
	COMPLIANCE %				99	86	96	100	100	100	96	95	773	97
1B	120	170	120	170	201	199	227	270	254	228	229	212		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 1:

Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	10:00	12:00	13:00	14:00	15:00	16:00	17:00		
2A	480	720	600	900	456	429	502	597	633	583	511	509		
	COMPLIANCE %				51	48	56	66	70	65	57	57	469	59
2B	50	75	50	75	138	134	137	153	151	121	131	123		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 2:

Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	13:00	799	161	278	58 %	50 %
	14:00	807	157	274	57 %	
	15:00	725	135	315	43 %	
	9:00	693	137	332	41 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: East Street at Queen Street Count Date: 2017-08-15

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	10:00	12:00	13:00	14:00	15:00	16:00	17:00		
1A	480	720	600	900	901	776	891	1,078	1,065	976	901	902		
	COMPLIANCE %				100	86	99	100	100	100	100	100	785	98
1B	120	170	120	170	89	158	239	294	262	247	239	251		
	COMPLIANCE %				52	93	100	100	100	100	100	100	745	93

Restricted Flow	Both 1A and 1B 100% Fullfilled each of 8 hours	Yes ☐	No ☑
Signal Justification 1:	Lesser of 1A or 1B at least 80% fulfilled each of 8 hours	Yes ☑	No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	10:00	12:00	13:00	14:00	15:00	16:00	17:00		
2A	480	720	600	900	654	500	531	625	654	606	520	526		
	COMPLIANCE %				73	56	59	69	73	67	58	58	513	64
2B	50	75	50	75	96	146	203	255	229	206	220	217		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow	Both 2A and 2B 100% Fullfilled each of 8 hours	Yes ☐	No ☑
Signal Justification 2:	Lesser of 2A or 2B at least 80% fulfilled each of 8 hours	Yes ☐	No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	13:00	784	228	285	80 %	66 %
	14:00	803	202	276	73 %	
	15:00	729	179	313	57 %	
	17:00	651	190	356	53 %	

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Pim Street at Queen Street Count Date: 2017-08-09

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	1,111	1,325	1,636	1,424	1,381	1,410	1,705	1,260		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	120	170	120	170	510	883	1,077	967	1,001	1,024	1,300	975		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 1:

Both 1A and 1B 100% Fullfilled each of 8 hours — Yes ☑ No ☐
Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☑ No ☐

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	9:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	601	442	559	457	380	386	405	285		
	COMPLIANCE %				67	49	62	51	42	43	45	32	391	49
2B	50	75	50	75	105	145	183	161	161	144	164	118		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100

Restricted Flow
Signal Justification 2:

Both 2A and 2B 100% Fullfilled each of 8 hours — Yes ☐ No ☑
Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES ☑	NO ☐	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	17:00	405	1,087	516	100 %	100 %
	13:00	559	809	411	100 %	
	14:00	457	705	479	100 %	
	16:00	386	839	530	100 %	

Appendix D – Signal Warrants for Two-Way Operation

Bay Street & Huron Street

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	228	25%	**48%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	120	71%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	108	12%	**41%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	120	71%	

Bay Street & Gore Street

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	425	47%	**62%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	130	76%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	296	33%	**53%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	125	74%	

Bay Street & Dennis Street

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	378	42%	**50%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	99	58%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	280	31%	**39%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	81	48%	

Bay Street & Ron Francis Way

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	392	44%	**48%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	90	53%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	302	34%	**37%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	68	40%	

Bay Street & Elgin Street

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	524	58%	**71%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	144	85%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	381	42%	**59%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	127	75%	

Bay Street & Spring Street

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	421	47%	**37%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	45	26%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	377	42%	**31%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	34	20%	

Bay Street & Brock Street

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	482	54%	**59%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	108	64%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	375	42%	**43%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	75	44%	

Bay Street & East Street

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	426	47%	**40%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	56	33%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	370	41%	**34%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	46	27%	

Bay Street & Pim Street

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	216	24%	**24%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	42	25%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	174	19%	**10%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	0	0%	

Queen Street & Huron Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	472	52%	**87%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	207	122%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	265	29%	**70%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	188	111%	

Queen Street & Gore Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	367	41%	**48%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	95	56%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	272	30%	**42%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	90	53%	

Queen Street & Dennis Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	387	43%	**51%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	100	59%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	287	32%	**40%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	83	49%	

Queen Street & Bruce Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	528	59%	**103%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	249	146%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	279	31%	**52%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	124	73%	

Queen Street & Elgin Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	508	56%	**66%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	128	75%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	381	42%	**54%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	111	65%	

Queen Street & Spring Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	465	52%	**52%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	88	52%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	377	42%	**44%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	77	45%	

Queen Street & Brock Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	499	55%	**64%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	125	74%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	375	42%	**48%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	92	54%	

Queen Street & East Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	453	50%	**50%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	84	49%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	370	41%	**42%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	73	43%	

Queen Street & Pim Street

Traffic Signal Justification for Future Development

OTM Book 12 (November, 2007) Section 4.10 - Table 19 - Justification 7 - Projected Volumes

Justification 1: 120% met? (Existing Intersection)	[Y/N]	N	Warranted only if Justification 1 & 2 are
Justification 2: 120% met? (Existing Intersection)	[Y/N]	N	fullfilled to % criteria.

Restr flow = urban conditions, < 70km/hr posted speed
Free Flow = rural case, 70km/hr or greater posted speed

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehichle volume, all approaches (avg hour)	480	720	600	900	664	74%	**107%**
	B. Vehicle volume, along minor streets (avg hour)	120	170	120	170	238	140%	
2. Delay to cross traffic	A. Vehicle volume, major street (avg hour)	480	720	600	900	426	47%	**41%**
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (avg hour)	50	75	120	170	58	34%	