

CARACO DEVELOPMENT CORPORATION

18M-00593-00

TRAFFIC IMPACT STUDY UPDATE FOR 129 SOUTH STREET, GANANOQUE

June 27, 2018







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CARACO DEVELOPMENT CORPORATION

REPORT

DATE: JUNE 27, 2018

COVER IMAGE SOURCE: GOOGLE MAPS (2018), TOWN OF
GANANOQUE INSTAGRAM

WSP

WSP.COM



18M-00593-00

Ken Dantzer
Development Manager
CaraCo Development Corporation
234 Concession Street, Suite 101
Kingston, ON K7K 6W6

Dear Mr. Dantzer:

Subject: Traffic Impact Study Update – 129 South Street, Gananoque

WSP Canada Group Limited (WSP) is very pleased to present our Traffic Impact Study for your proposed condominium development to be located at 129 South Street in the Town of Gananoque.

This report analyzes the transportation impacts for this development, and addresses the suitability of the proposed parking arrangement and site circulation requirements. The expected traffic conditions in 2023 are not greatly impacted by the construction of this development, and the available roadway capacity is anticipated to be adequate to support the 38 a.m. peak hour and 60 p.m. peak hour trips generated by this site. Additionally, the proposed parking supply meets the Town's By-law requirements, and no issues are expected to arise from a traffic operations perspective.

We trust that this study adequately addresses the transportation impacts of your proposed development. Please contact us if you have any questions or comments with respect to our report.

Yours sincerely,

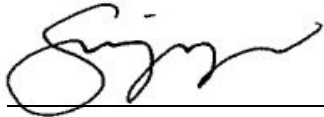
A handwritten signature in black ink, appearing to read 'D. Richardson', with a long horizontal line extending to the right.

David B. Richardson, P.Eng., P.T.O.E.
Manager – Transportation
Planning & Advisory Services

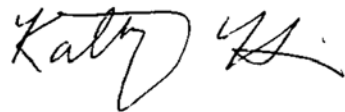
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SIGNATURES

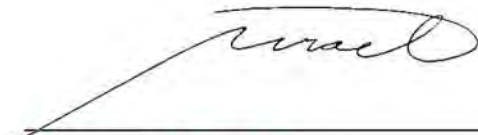
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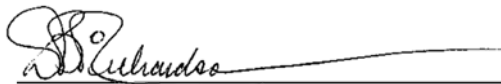


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- A** TRAFFIC COUNT DATA AND SIGNAL TIMING PLANS
- B** LEVEL OF SERVICE DEFINITIONS
- C** EXISTING INTERSECTION CAPACITY ANALYSIS
- D** FUTURE BACKGROUND INTERSECTION CAPACITY ANALYSIS
- E** TOTAL FUTURE INTERSECTION CAPACITY ANALYSIS

1 INTRODUCTION

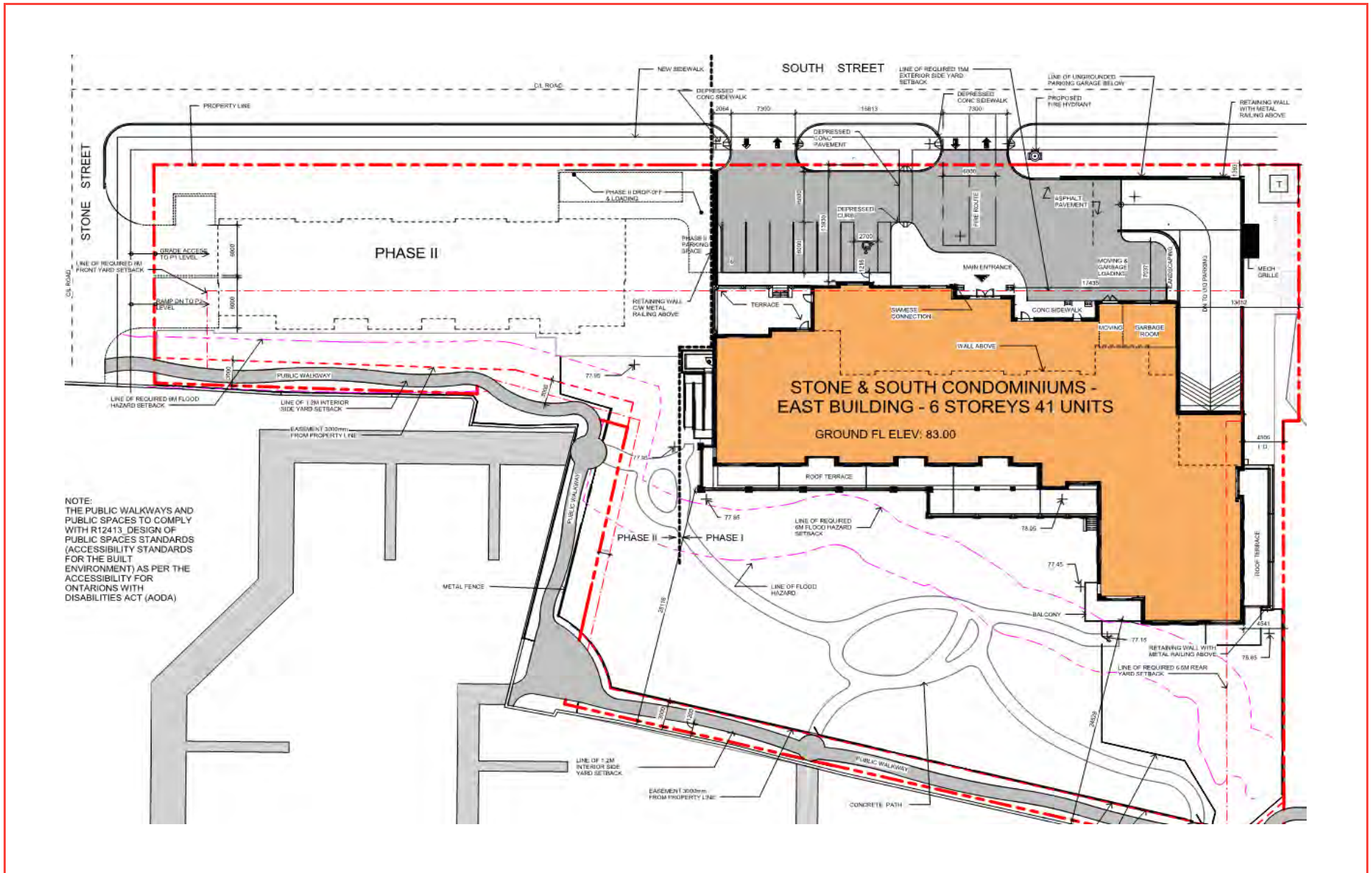
WSP Canada Group Limited (WSP) was retained by CaraCo Development Corporation to prepare a Traffic Impact Study (TIS) in support of the proposed residential development to be located at 129 South Street in the Town of Gananoque.

This development is proposed to consist of 70 condominium units in two buildings, and this report documents the assessment of the transportation issues associated with the proposed development.

The study area is shown in Figure 1-1 while the concept development site plan is illustrated in Figure 1-2.



Proposed Site Location



2 EXISTING CONDITIONS

2.1 STUDY AREA AND DATA COLLECTION

The study area for this traffic impact study includes the following intersections. The existing lane configurations are shown in **Figure 2-1**:

- South Street at Stone Street South (Unsignalized);
- Stone Street South at Water Street (Unsignalized);
- King Street East at Stone Street South (Signalized);
- King Street East at Charles Street South (Signalized); and
- King Street East at William Street South (Signalized).

Accu-Traffic Inc. was retained to conduct turning movement counts (TMC) at the above-noted intersections. The TMCs were collected during the weekday periods from 7 to 9 a.m. and from 4 to 6 p.m. on Tuesday, September 24, 2013. These counts have been grown to the year 2018 based on growth rates provided in Section 4.2 in this report to arrive at the 2018 “existing” traffic volumes. These volumes are shown in **Figure 2-2**, and the peak hour traffic data, along with the existing signal timing plans are provided in **Appendix A**.

2.2 TRANSIT

Currently, there is no transit service offered in the Town of Gananoque, nor are there any plans for future service. Accordingly, this travel mode has not been factored into our analysis.

2.3 METHODOLOGY

Traffic conditions in the study area were analyzed using the Synchro 8 traffic analysis software. This software incorporates the methodology outlined in the Highway Capacity Manual (HCM), Transportation Research Board, 2000. The intersection capacity analysis provides an indication of traffic operations based on calculations of volume-to-capacity (v/c) and delays for individual movements at an intersection. A Level of Service (LOS) denoted by letters ‘A’ through ‘D’ represents satisfactory traffic operations. LOS denoted by the letters ‘E’ and ‘F’ indicates congested traffic conditions. The Level of Service definitions for signalized and unsignalized intersections are included in **Appendix B**.

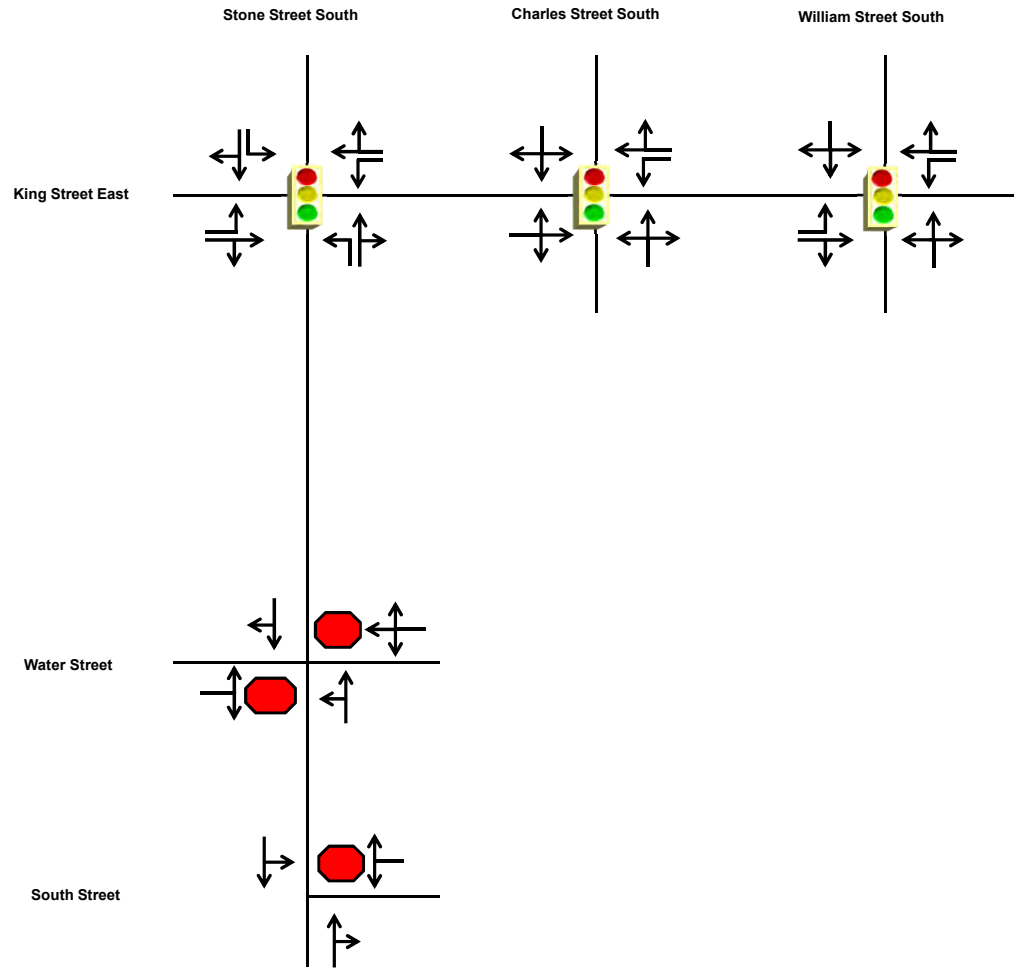
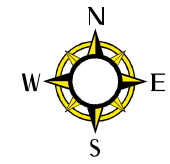
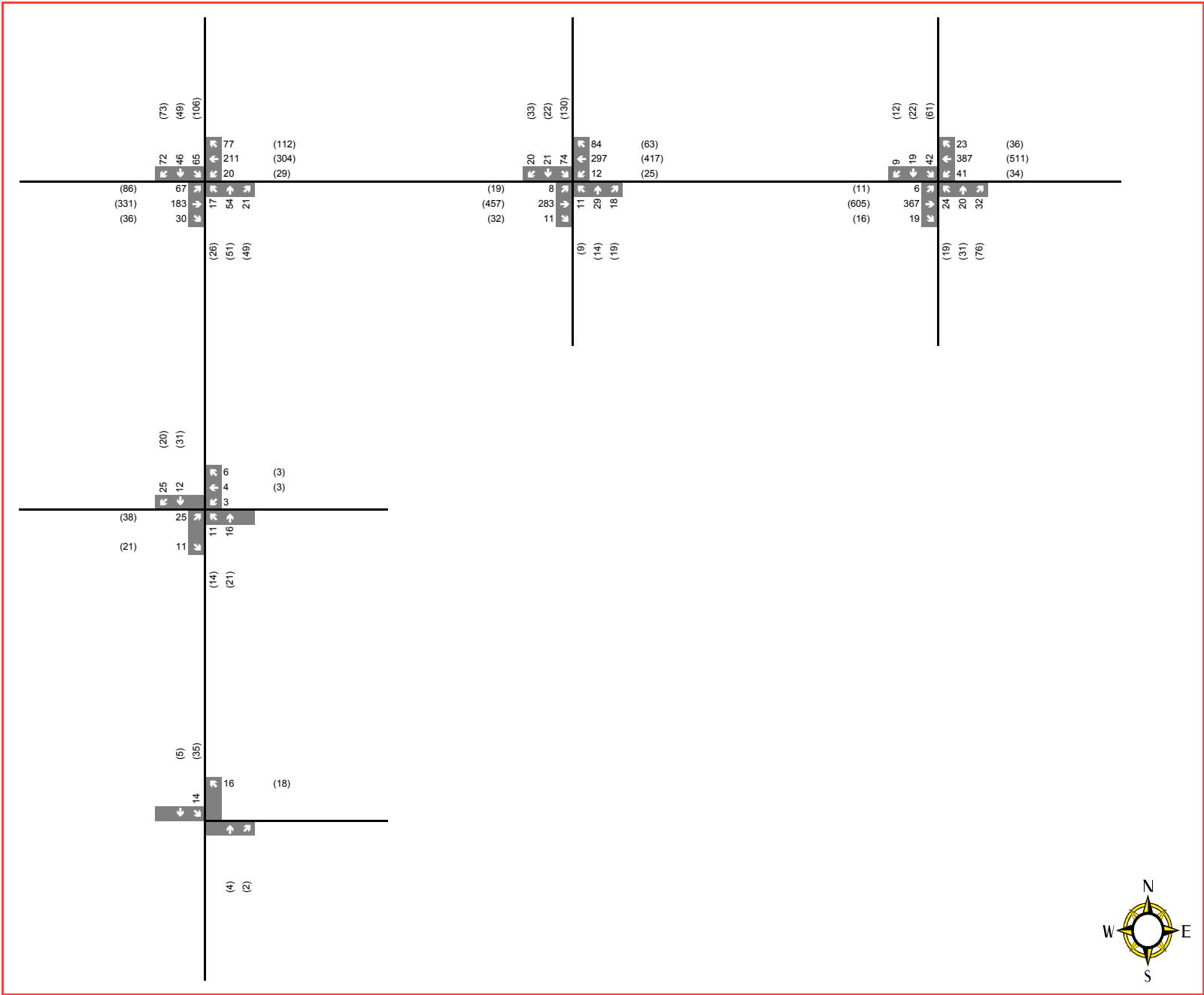


Figure 2.1
Existing Lane Configurations



xx A.M. Peak Hour Traffic Volumes
 (xx) P.M. Peak Hour Traffic Volumes
 {xx} Weekend Peak Hour Traffic Volumes

Figure 2.2
 Existing Traffic Volumes

2.4 EXISTING TRAFFIC OPERATIONS

Traffic operations were analyzed at the previously noted intersections to determine the existing LOS during the weekday a.m. and p.m. peak hours. The results of the intersection capacity analysis for existing conditions are summarized in **Table 2-1**. Detailed intersection capacity analysis sheets are included in **Appendix C**.

Table 2-1: Existing Traffic Conditions

Intersection	Control Type	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		LOS (Delay in Seconds)	Critical Movements (v/c)	LOS (Delay in Seconds)	Critical Movements (v/c)
South Street at Stone Street South	Unsignalized	A (8.4)	--	A (8.5)	--
Stone Street South at Water Street	Unsignalized	A (9.2)	--	A (9.5)	--
King Street East at Stone Street South	Signalized	C (22.3)	--	C (22.2)	--
King Street East at Charles Street South	Signalized	B (11.7)	--	B (12.4)	--
King Street East at William Street South	Signalized	A (9.7)	--	B (11.4)	--

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.

2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

Under existing conditions, the study area intersections operate at LOS 'C' or better, indicating that there are low delays at these intersections. No operational issues are noted from the results of the traffic analysis.

3 SITE-GENERATED TRAFFIC

3.1 TRIP GENERATION

The trip generation associated with the proposed residential development was based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. Land Use Code 230 – Condominium was used to develop site-generated trips for this development. A summary of the trip generation information for the proposed development is presented in **Table 3-1**.

Table 3-1: Trip Generation

ITE LAND USE CODE (MAGNITUDE)	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips
230 Condominium (70 Units)	7	32	30	15
TOTAL	39		45	

As indicated in Table 3-1, the proposed development is expected to generate a total of 39 and 45 trips in the weekday a.m. and p.m. peak hours, respectively.

3.2 TRIP DISTRIBUTION AND ASSIGNMENT

The projected residential distribution was developed based on the distribution of existing traffic in the area, as determined by the turning movement counts which were conducted. The distribution is summarized in **Table 3-2**, and **Figure 3-1** illustrates the resulting site traffic assignment of the trips generated by this development.

Table 3-2: Trip Distribution

Gateways	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
	Inbound Trips	Outbound Trips	Inbound Trips	Outbound Trips
King Street (E of William)	36.8%	32.3%	33.8%	40.0%
King Street (W of Stone)	23.7%	22.6%	27.1%	22.0%
Water Street (W of Stone)	3.4%	3.3%	4.0%	2.2%
Water Street (E of Stone)	1.0%	0%	0.3%	0.0%
William Street (N of King)	6.6%	4.1%	6.4%	4.8%
William Street (S of King)	0.0%	6.7%	0.0%	4.5%
Charles Street (N of King)	11.0%	10.2%	12.7%	6.0%
Charles Street (S of King)	0.0%	3.7%	0.0%	4.9%
Stone Street (N of King)	17.5%	17.0%	15.7%	15.6%
TOTAL	100%	100%	100%	100%

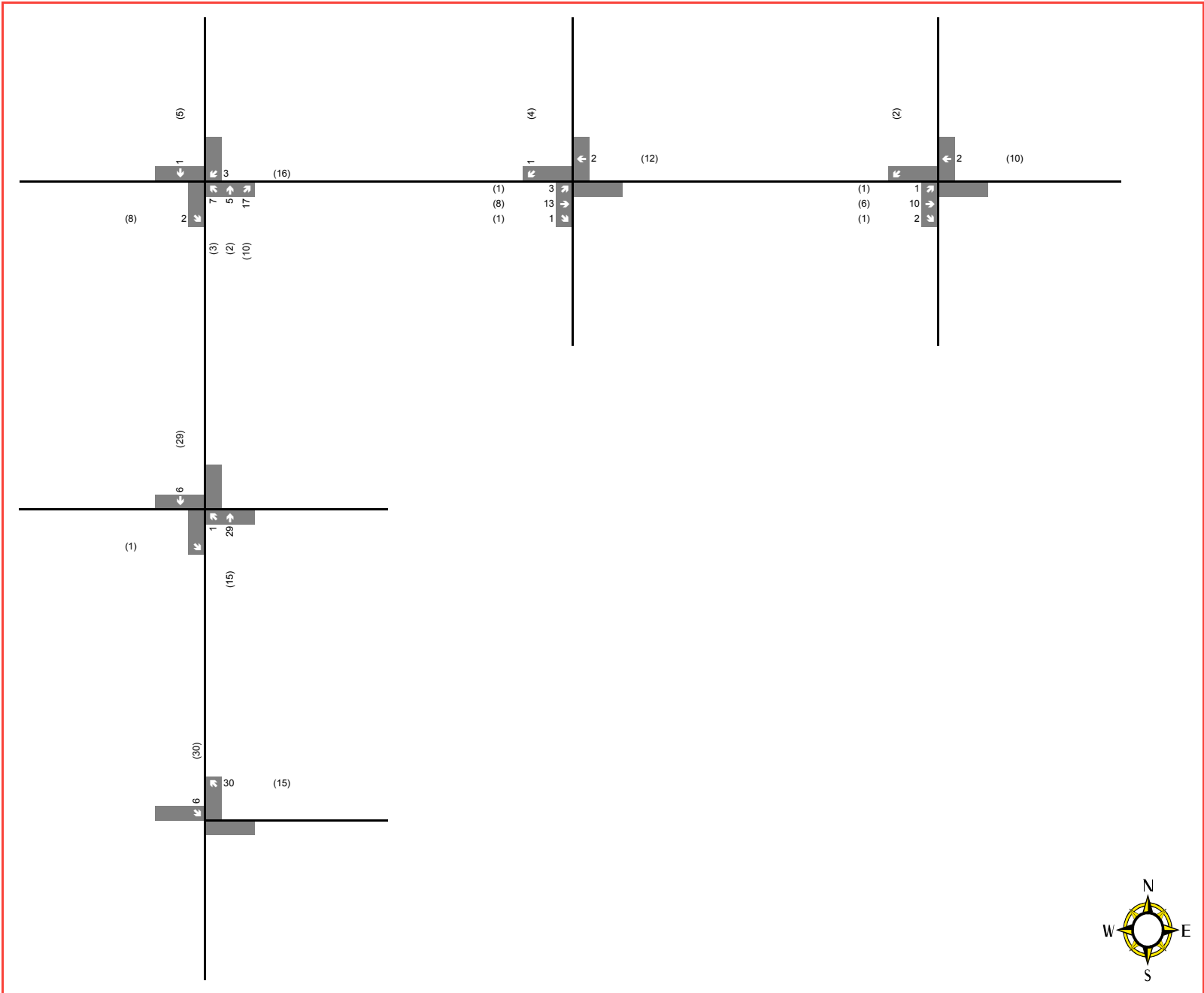


Figure 3.1
Site Generated Trips

4 FUTURE TRAFFIC CONDITIONS

4.1 BACKGROUND INFORMATION

Based on information from the Town of Gananoque, there are no major roadway improvements proposed within the study area over the five-year study horizon.

4.2 BACKGROUND GROWTH

The future background volumes were determined by using the average growth rate within the Town of Gananoque, as calculated by comparing the existing population and the future projected population in 2029 as indicated in the Official Plan. This growth rate was determined to be 0.8% per year. As a result, existing traffic volumes were grown linearly by this amount per year to the 2023 horizon year, which was then used for the future analysis. **Figure 4-1** illustrates the future background traffic volumes.

4.3 FUTURE BACKGROUND TRAFFIC OPERATIONS

The projected 2023 future background traffic volumes consist of existing traffic volumes plus the adjacent background growth as discussed in Section 4.2. The results of the intersection capacity analysis are shown in **Table 4-1**. Detailed intersection capacity analysis sheets are included in **Appendix D**.

Table 4-1: Future Background Traffic Conditions

Intersection	Control Type	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		LOS (Delay in Seconds)	Critical Movements (v/c)	LOS (Delay in Seconds)	Critical Movements (v/c)
South Street at Stone Street South	Unsignalized	A (8.4)	--	A (8.5)	--
Stone Street South at Water Street	Unsignalized	A (9.3)	--	A (4.8)	--
King Street East at Stone Street South	Signalized	C (22.6)	--	C (22.9)	--
King Street East at Charles Street South	Signalized	B (11.8)	--	B (13.0)	--
King Street East at William Street South	Signalized	A (9.9)	--	B (11.9)	--

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.

2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

The future background traffic conditions remain largely unchanged from the existing traffic conditions, with delays increasing by a very small amount. As a result, the future background scenario is expected to continue to operate well during both peak hours.

4.4 TOTAL FUTURE TRAFFIC CONDITIONS

The total future traffic conditions were calculated by taking the site-generated traffic as detailed in Section 3, and adding it to the background traffic volumes shown in **Figure 4-1**. The resulting total future traffic volumes are shown in **Figure 4-2**, and a summary of the total future traffic operations are outlined below in **Table 4-2**. Detailed intersection capacity analysis sheets are included in **Appendix E**.

Table 4-2: Total Future Traffic Conditions

Intersection	Control Type	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		LOS (Delay in Seconds)	Critical Movement(s) (v/c)	LOS (Delay in Seconds)	Critical Movement(s) (v/c)
South Street at Stone Street South	Unsignalized	A (8.5)	--	A (8.6)	--
Stone Street South at Water Street	Unsignalized	A (9.5)	--	A (9.8)	--
King Street East at Stone Street South	Signalized	C (22.5)	--	C (23.0)	--
King Street East at Charles Street South	Signalized	B (11.7)	--	B (13.1)	--
King Street East at William Street South	Signalized	A (9.9)	--	B (12.0)	--

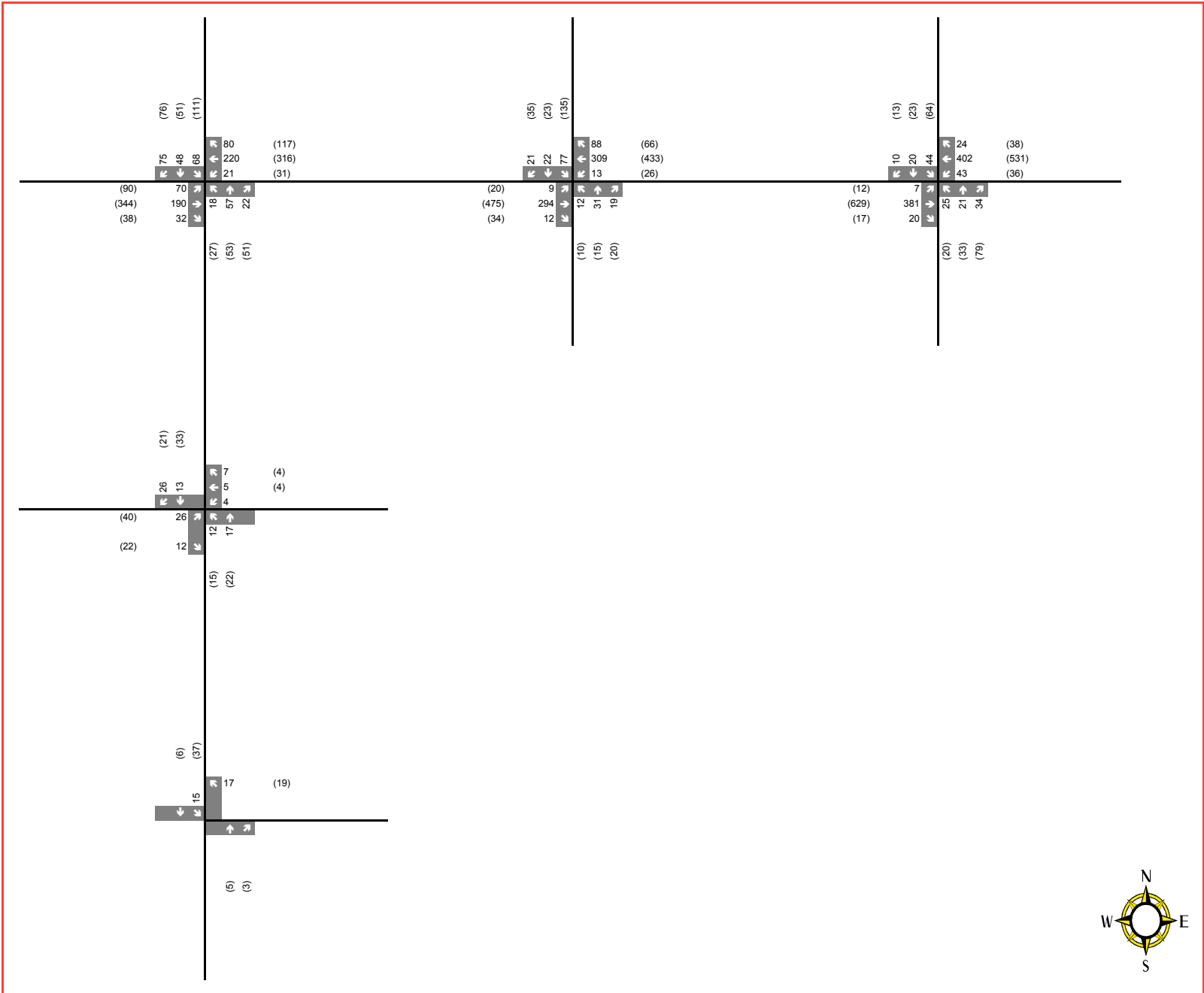
Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.

2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

The addition of the site generated traffic has resulted in very marginal impacts on the study area network. All of the intersections are expected to operate at virtually the same level of service compared to future background conditions, with the estimated increase in delay expected to be, at most, 1.6 seconds per vehicle. As a result, the development can be readily accommodated by the existing road network with no improvements necessary.

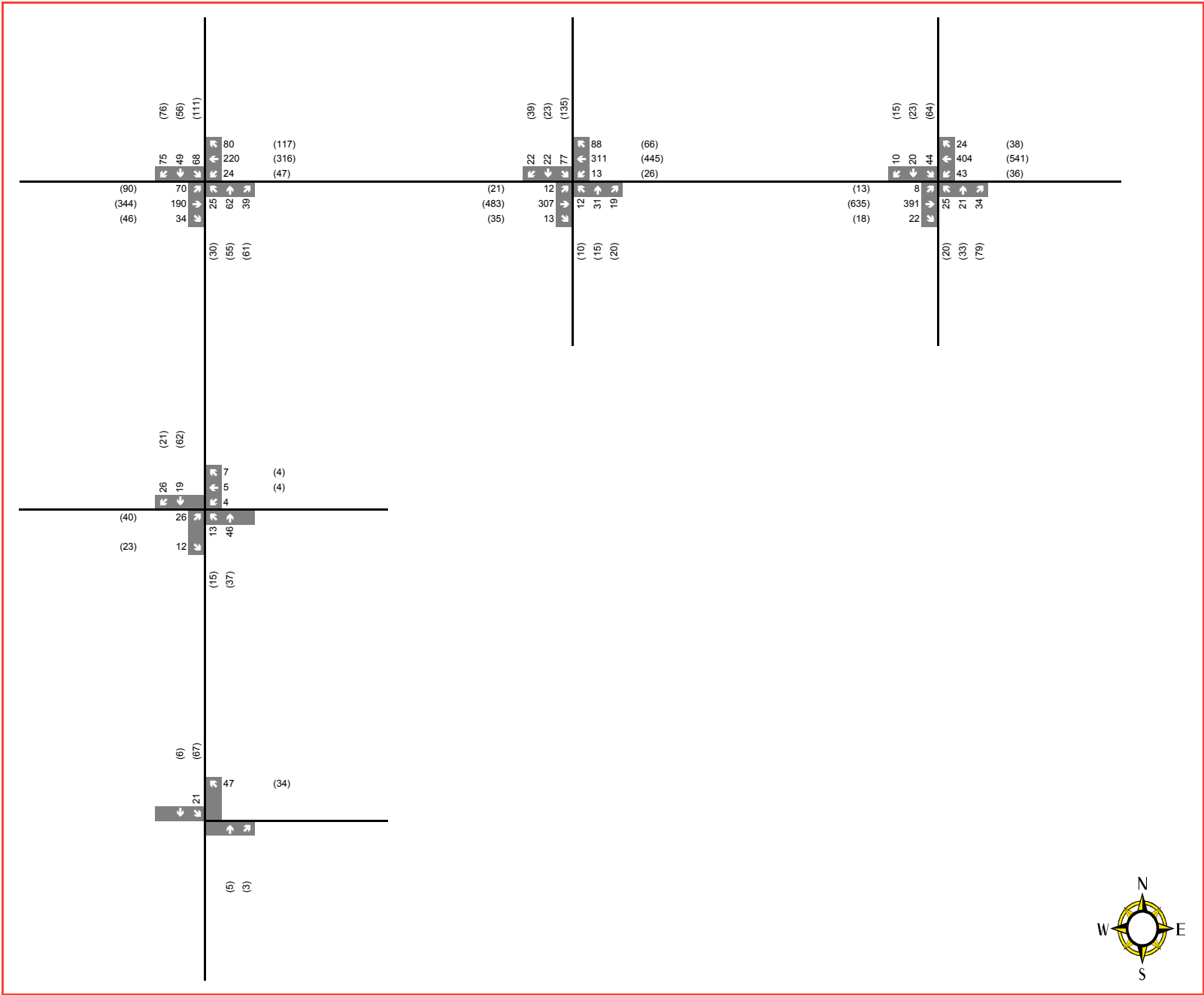
4.5 SEASONAL VARIATION

Based on discussions with Town staff in March 2014 and February 2015, a sensitivity analysis was conducted using factors from MTO's Seasonal Variation Curves. These values were applied to the traffic volumes at the King Street and Stone Street intersection to account for the summer months when traffic conditions tend to be higher in Gananoque. The "Intermediate Recreation" curve is the most appropriate for this study since MTO counting stations in this area (Highway 401 at Highway 2 and at Highway 32) are represented by these curves. As a result, we have increased the eastbound and westbound through volumes on King Street by a factor of **1.21** based on the factor derived from this curve. We received confirmation from Town staff that this approach was acceptable, and subsequently this was documented in our February 2015 addendum letter. The updated analyses for the existing, future background and total future traffic conditions are presented in **Table 4-3** through **4-5**, respectively.



xx A.M. Peak Hour Traffic Volumes
 (xx) P.M. Peak Hour Traffic Volumes
 {xx} Weekend Peak Hour Traffic Volumes

Figure 4.1
 Future Background Traffic Volumes



xx A.M. Peak Hour Traffic Volumes
 (xx) P.M. Peak Hour Traffic Volumes
 {xx} Weekend Peak Hour Traffic Volumes

Figure 4.2
 Future Total Traffic Volumes

Table 4-3: Existing Traffic Conditions

Intersection	Control Type	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		LOS (Delay in Seconds)	Critical Movement(s) (v/c)	LOS (Delay in Seconds)	Critical Movement(s) (v/c)
King Street East at Stone Street South	Signalized	C (26.3)	--	C (28.3)	--

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.
 2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

Table 4-4: Future Background Traffic Conditions

Intersection	Control Type	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		LOS (Delay in Seconds)	Critical Movement(s) (v/c)	LOS (Delay in Seconds)	Critical Movement(s) (v/c)
King Street East at Stone Street South	Signalized	C (26.7)	--	C (29.2)	--

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.
 2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

Table 4-5: Total Future Traffic Conditions

Intersection	Control Type	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		LOS (Delay in Seconds)	Critical Movement(s) (v/c)	LOS (Delay in Seconds)	Critical Movement(s) (v/c)
King Street East at Stone Street South	Signalized	C (26.7)	--	C (29.4)	--

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.
 2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

Based on the information in Table 4-3 through 4-5, the addition of the Seasonal Variation Curve adjustments has resulted in very marginal impacts at the King Street East/Stone Street South intersection. This location continues to operate at LOS 'C' under existing conditions, and also operates at the same LOS under future background and total future conditions. Accordingly, the study area network is able to accommodate the site-generated trips while accounting for seasonal recreational traffic, without requiring any road network improvements.

5 PARKING REQUIREMENTS

The Town of Gananoque’s Development Permit By-law, dated October 2010, stipulates that parking for apartment dwellings requires a minimum of 1.25 spaces per unit. Additionally, one barrier-free parking space is required for every 20 standard parking spaces (or part thereof), and is to be included as part of the overall total. **Table 5-1** summarizes the parking requirements related to the proposed development.

Table 5-1: By-Law Parking Requirements

Land Use	Minimum Parking Requirements	Magnitude of Proposed Use	Number of Spaces Required
Residential (Apartment)	1.25 spaces per dwelling unit	70	88
Barrier-free Parking	1.0 spaces for every 20 standard spaces (or part thereof)		4*
Total Required			88 spaces
Total Supplied			96 spaces

** These spaces are included as part of the overall total of required parking spaces.*

Based on the above, the proposed development is supplying a sufficient number of parking spaces in accordance with the Town’s By-law requirement. The current site plan illustrates an at-grade visitor’s parking supply of six spaces, as well as a total of five barrier-free parking spaces for the site. With the barrier free spaces exceeding the total number of parking spaces required by the by-law, the 96 spaces in the proposed development more than satisfies the Zoning By-law.

In addition, a total of 53 long-term bicycle parking spaces are included which are distributed between both underground parking levels.

6 LOADING OPERATIONS AND SITE CIRCULATION ASSESSMENT

6.1 LOADING OPERATIONS

We have reviewed the Town of Gananoque loading space regulations in the Development Permit By-law document, Section 3.26 General Provisions – Loading requirements. Based on the document, loading is only required for industrial or commercial designations. Therefore, based on the development permit by-law, loading spaces are not necessary for residential designations. However, a loading area has been proposed for this development to accommodate any deliveries, move-in/move-out activities and garbage pickup, in order to minimize any conflicts that may arise. The loading area is located adjacent to the ramp entrance near the main entrance of the east building.

6.2 VEHICLE MANOEUVRING ASSESSMENTS

Our site circulation assessment was completed using the AutoTURN 10.0 software package to ensure adequate manoeuvrability through the site. The vehicle movements were tested using the site plan drawings dated June 21, 2018.

The vehicles used for the AutoTURN analyses were a Transportation Association of Canada (TAC) standard passenger vehicle, a typical medium single-unit (MSU) truck, as well as typical fire and garbage trucks. Accordingly, our AutoTURN analyses are illustrated in **Figure 6-1** to **6-7**, and our findings and recommendations are as follows.

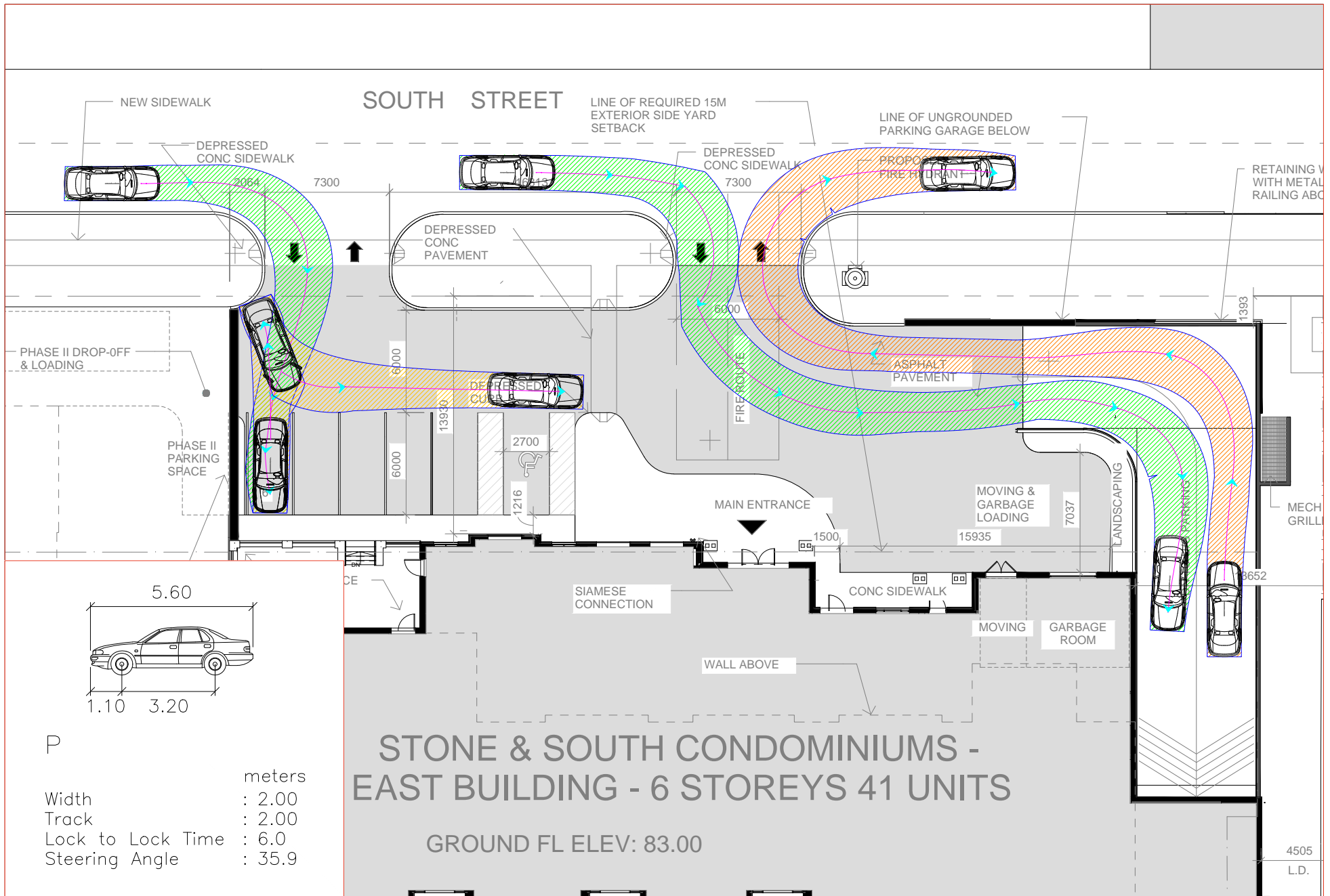
6.2.1 TAC PASSENGER VEHICLE MANOEUVRES

A Transportation of Canada (TAC) standard passenger vehicle was tested entering, parking and exiting via the site driveways and underground ramp. Simultaneous inbound and outbound movements for passenger vehicles show no conflicts with each other, and they function well as shown in Figure 6-1.

Furthermore, a TAC standard passenger vehicle was tested entering, exiting and circulating through the underground parking levels Phase I P1, Phase 2 P1 and Phase 2 P2. A passenger vehicle was also tested maneuvering into and out of typical and critical parking spaces, including “dead-end” parking spaces. No maneuvering issues were identified, as illustrated in Figure 6-2 to Figure 6-4. However, we recommend that convex mirrors be installed near the end of ramps and at corners on all three parking levels to improve visibility and to mitigate any minor sightline obstructions. Finally, we observed the two dead-end parking spaces on the P2 level of the west building are more easily accessible with smaller sized vehicles as shown in Figure 6-4. We recommend providing small car parking signage to designate those spaces for smaller cars.

6.2.2 MEDIUM SINGLE UNIT TRUCK MANOEUVRES

A typical medium sized commercial truck was tested entering and exiting the site and loading space. The truck can manoeuvre onto the loading area with no conflict, as illustrated in Figure 6-5. A reverse manoeuvre from the loading area is recommended to exit the site with no conflicts.



P	Width	: 2.00
	Track	: 2.00
	Lock to Lock Time	: 6.0
	Steering Angle	: 35.9

FIGURE 6-1
PASSENGER VEHICLE PARKING AND CIRCULATION AT SITE ACCESS AND RAMP
PHASE I GROUND FLOOR
Scale 1:300



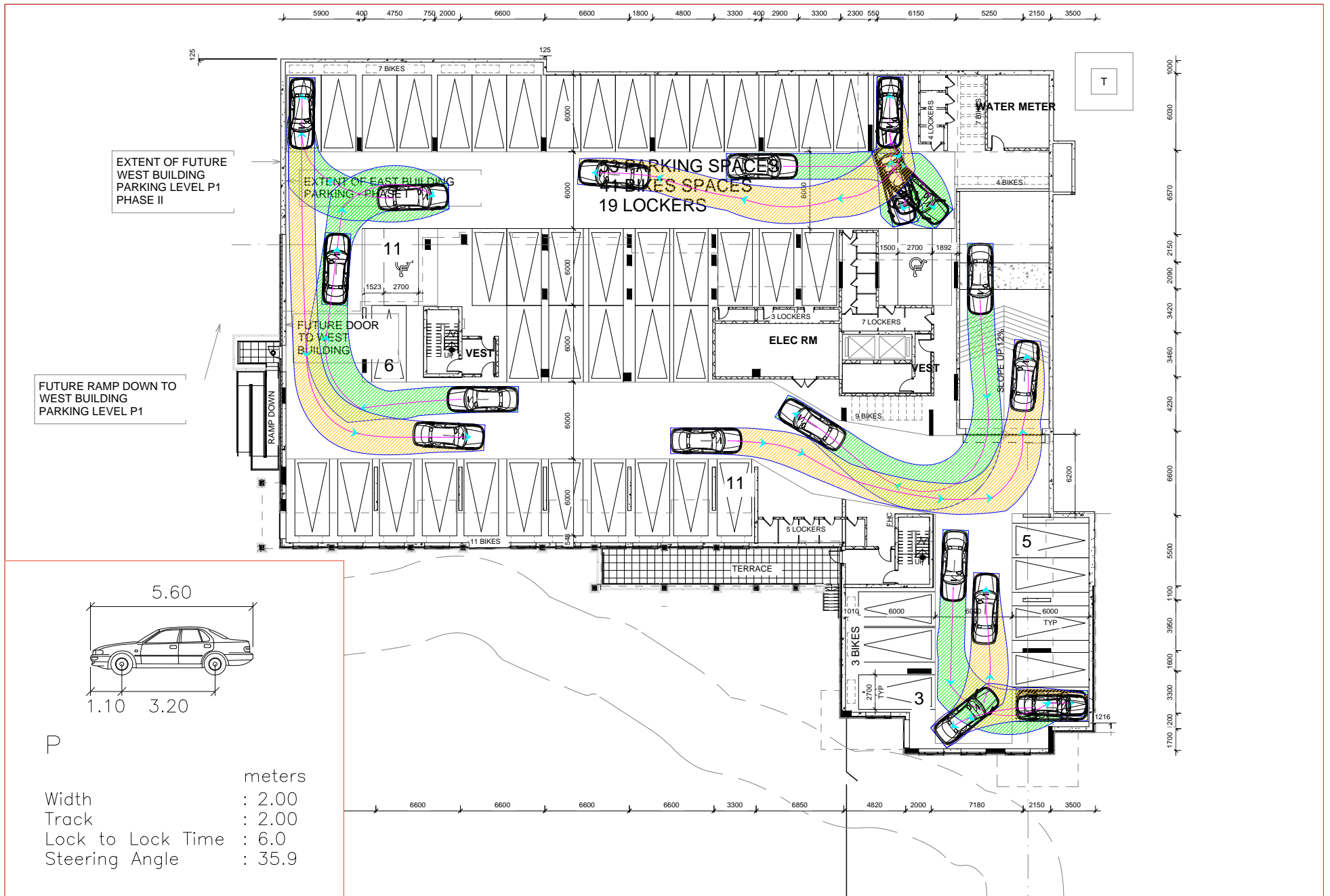
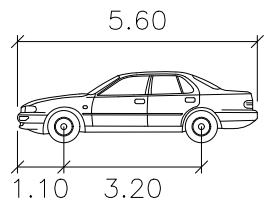
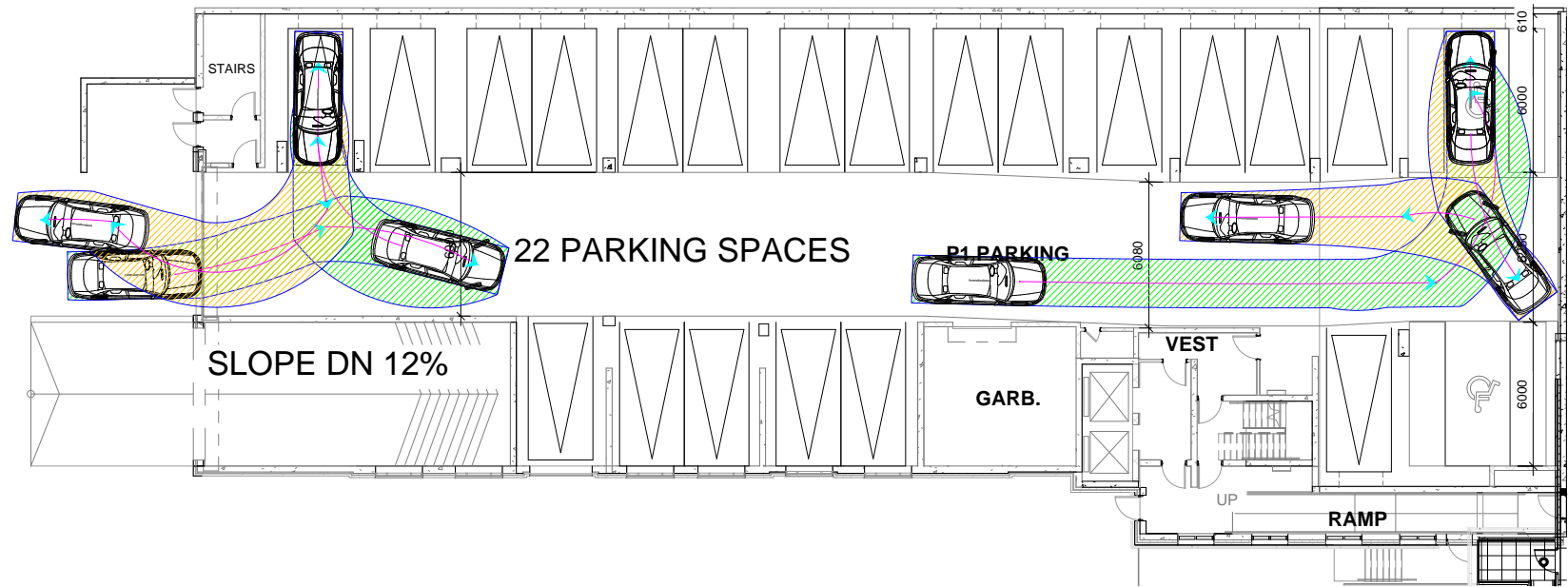


FIGURE 6-2
PASSENGER VEHICLE PARKING AND CIRCULATION AT EAST BUILDING P1 LEVEL
PHASE I P1 LEVEL
Scale 1:400

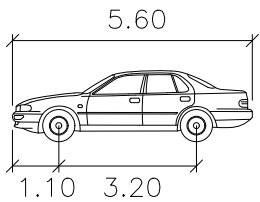
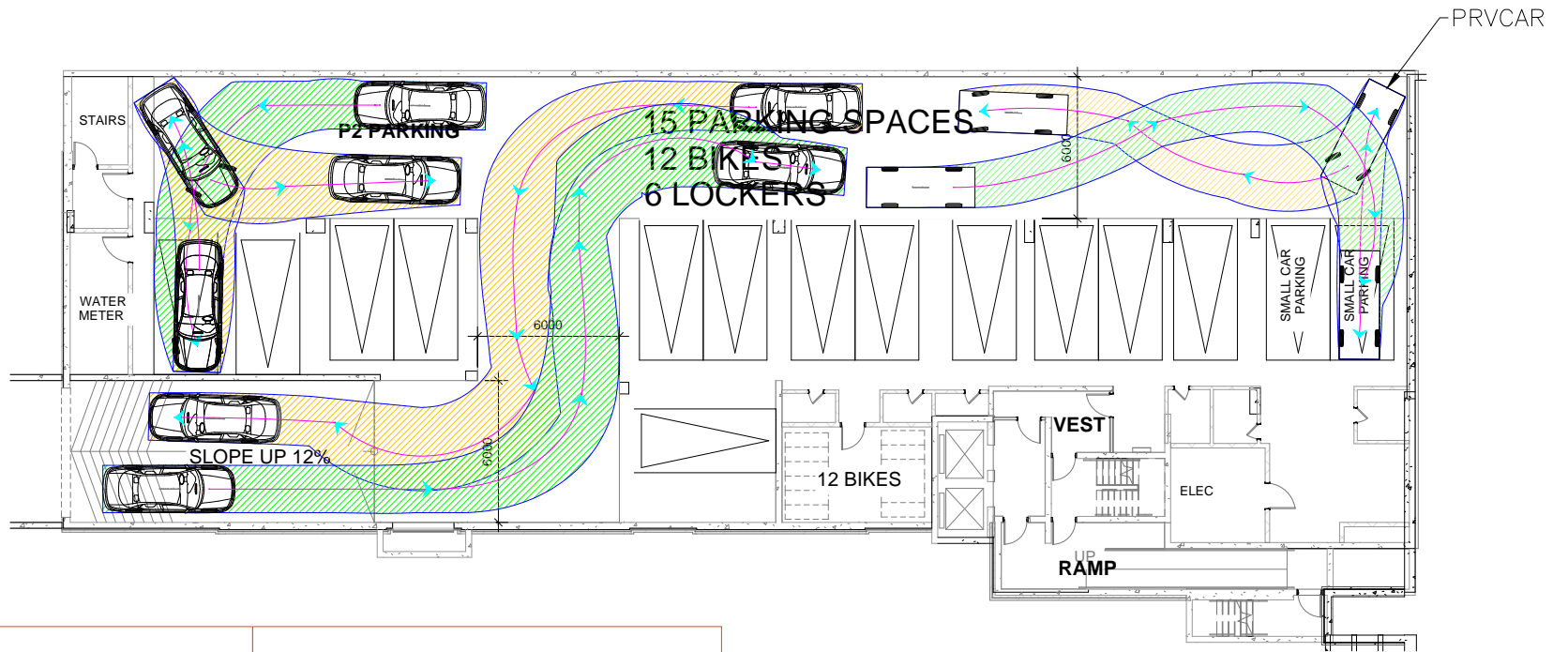




P		meters
Width	:	2.00
Track	:	2.00
Lock to Lock Time	:	6.0
Steering Angle	:	35.9

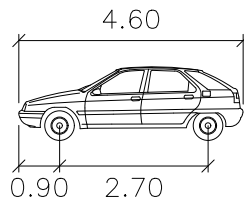


FIGURE 6-3
PASSENGER VEHICLE PARKING AND CIRCULATION AT WEST BUILDING P1 LEVEL
PHASE II P1 LEVEL
 Scale 1:300



P

Width : 2.00 meters
 Track : 2.00
 Lock to Lock Time : 6.0
 Steering Angle : 35.9



PRVCAR

Width : 1.70 meters
 Track : 1.70
 Lock to Lock Time : 6.0
 Steering Angle : 32.6



FIGURE 6-4
PASSENGER VEHICLE PARKING AND CIRCULATION AT WEST BUILDING P2 LEVEL
PHASE II P2 LEVEL
 Scale 1:300

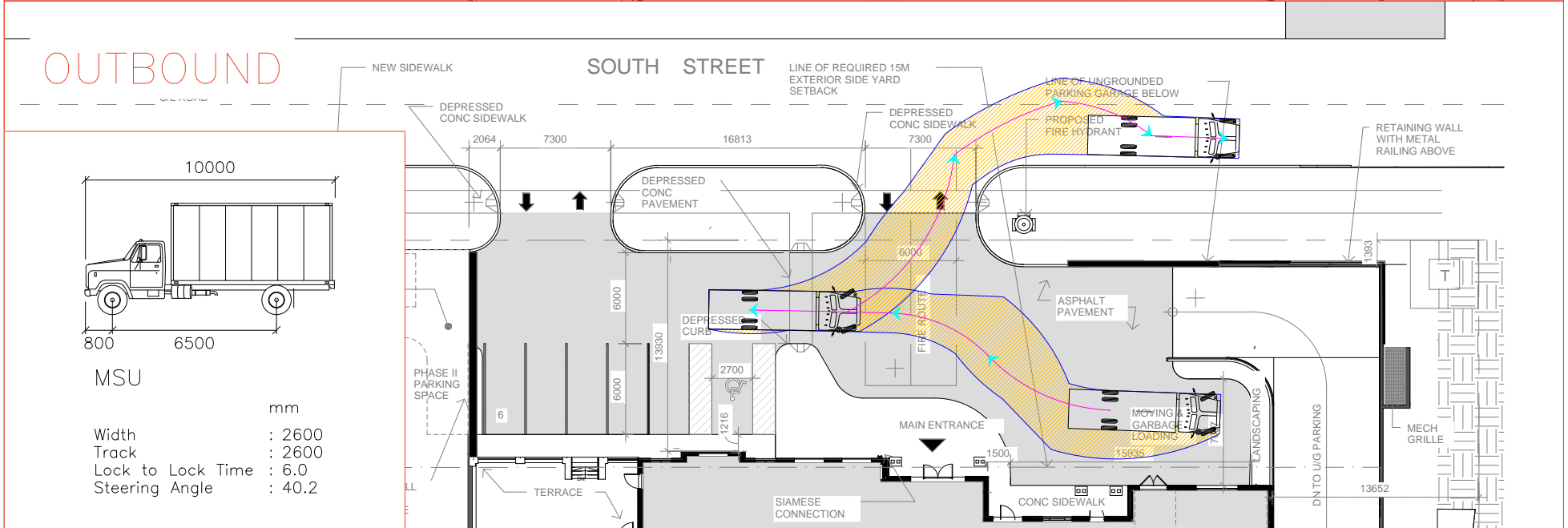
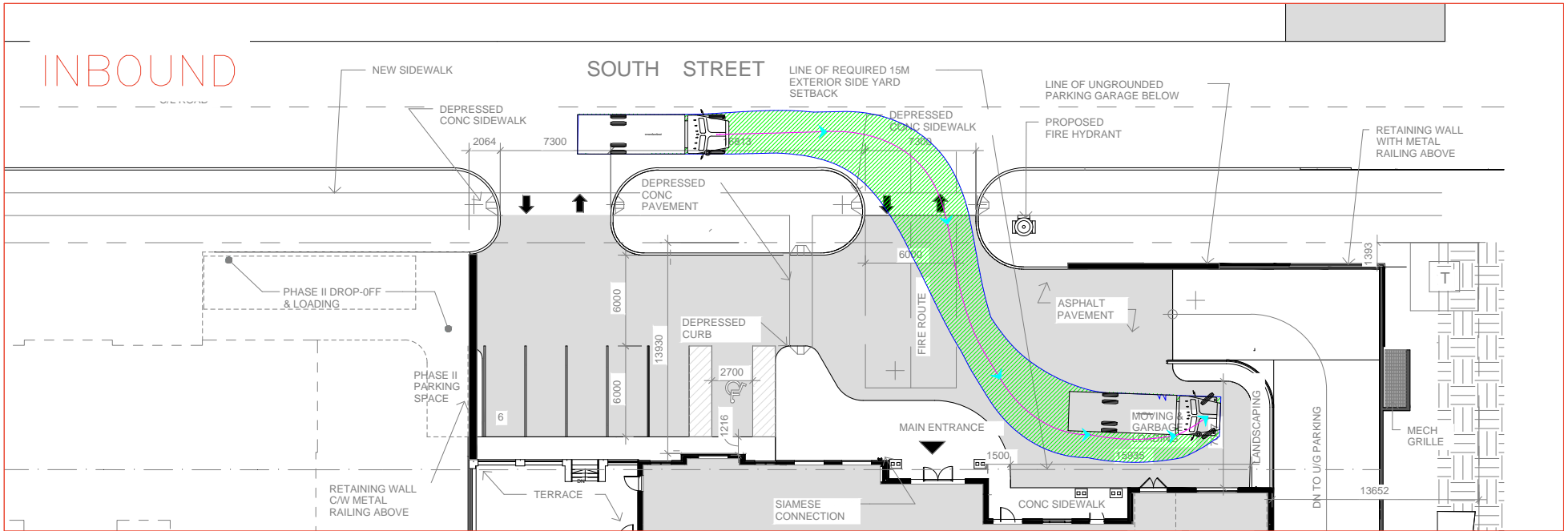


FIGURE 6-5
MEDIUM SINGLE UNIT TRUCK CIRCULATION
PHASE I GROUND FLOOR
 Scale 1:400

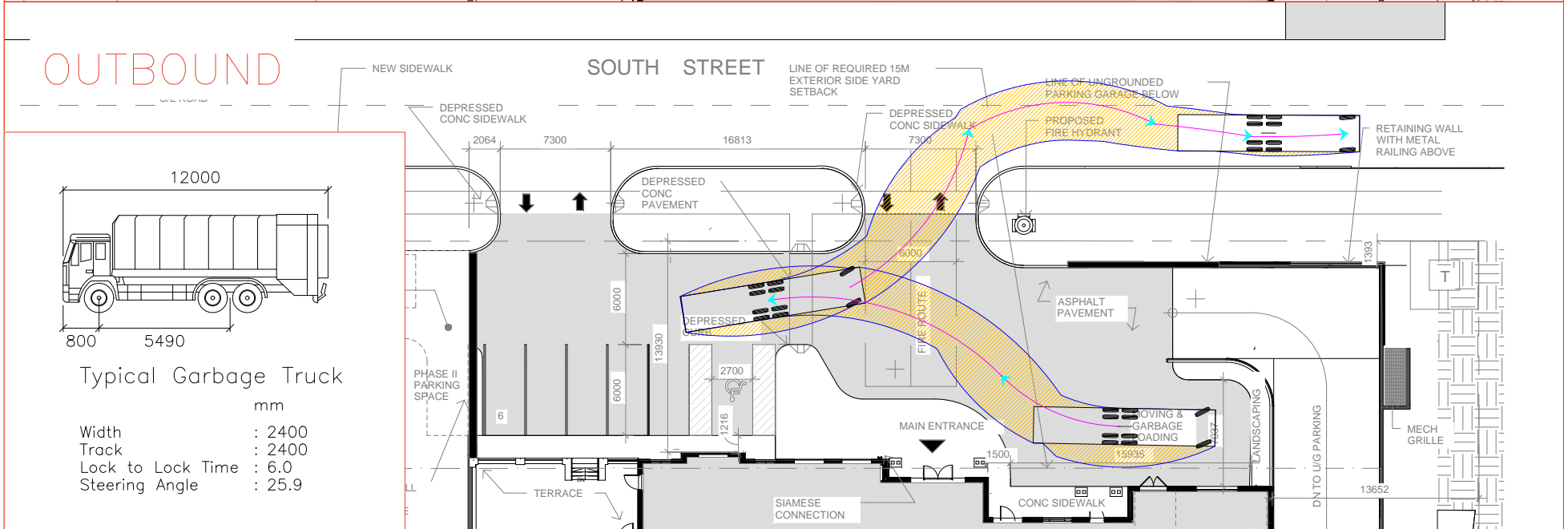
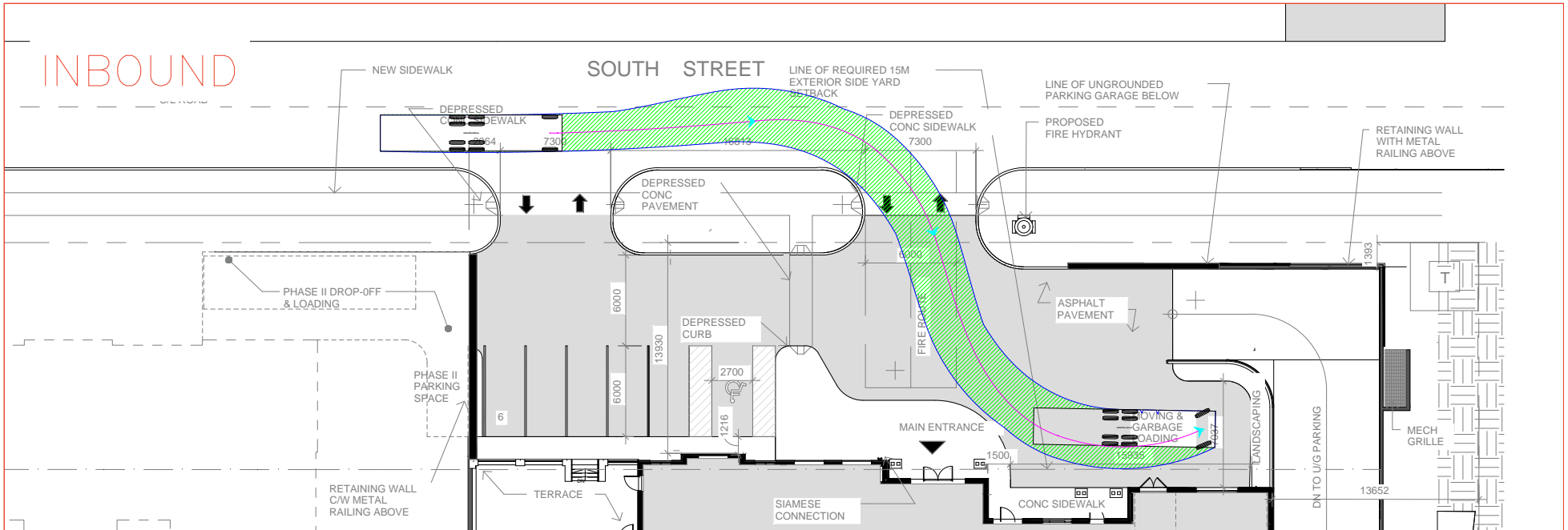
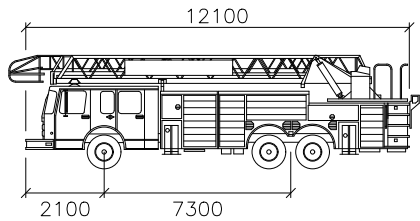
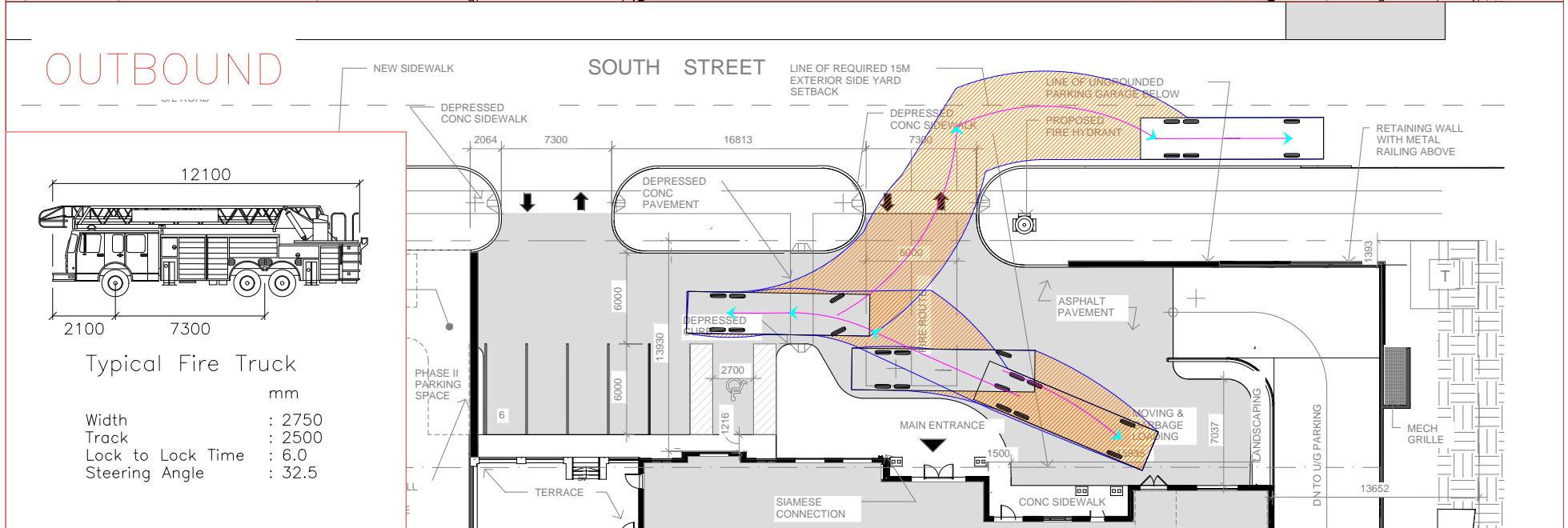
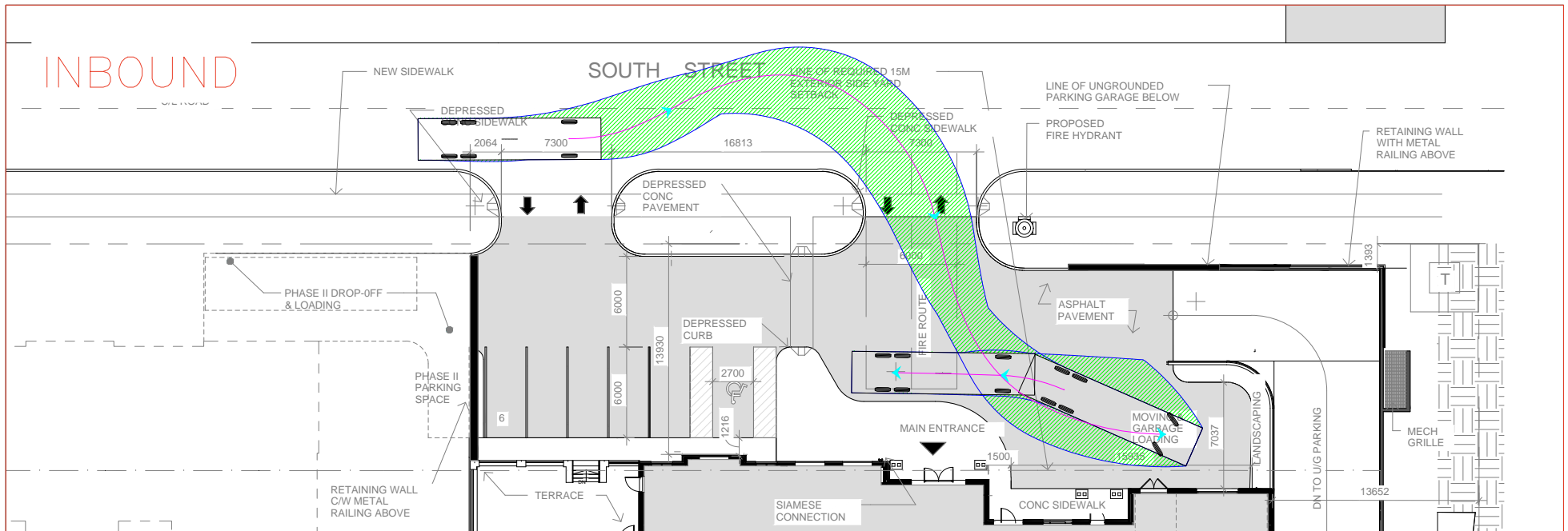


FIGURE 6-6
GARBAGE TRUCK CIRCULATION
PHASE I GROUND FLOOR
 Scale 1:400





Typical Fire Truck

	mm
Width	: 2750
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 32.5

FIGURE 6-7
FIRE TRUCK CIRCULATION
PHASE I GROUND FLOOR
Scale 1:400



7 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis, the following conclusions can be drawn:

- Under the existing conditions, all boundary road intersections are operating at good to excellent overall LOS during the a.m. and p.m. peak hours;
- The proposed development is estimated to generate a total of 39 and 45 trips in the weekday a.m. and p.m. peak hours, respectively;
- The future background traffic conditions indicate that there will be only minor increases in delay, but that the overall LOS of the study area intersections will remain good to excellent;
- The total future traffic conditions also indicate that the boundary road intersections will operate at the same Levels of Service as the future background scenario. Therefore, the effect of the proposed development on the overall road network capacity is minimal;
- The proposed parking supply for the condominium exceeds the requirements of the Town's Development Permit By-law, with a total of 172 spaces. This includes 163 standard stalls, of which 10 are dedicated for visitors, as well as nine barrier-free spaces for a surplus of 15 spaces relative to the By-law requirement;
- The provision of long-term bicycle parking will encourage the use of non-auto modes of travel;
- A site circulation assessment was conducted and passenger vehicles, garbage trucks, fire trucks and loading trucks can manoeuvre in, through, and out of the site with no issues; and
- Based on the preceding traffic study, no roadway or other improvements are required to support the expected traffic generated by the proposed development. Accordingly, from a traffic operations perspective, this development can proceed as planned.

APPENDIX

A TRAFFIC COUNT DATA AND SIGNAL TIMING PLANS



Accu-Traffic Inc.

Morning Peak Diagram	Specified Period From: 7:00:00 To: 9:00:00	One Hour Peak From: 8:00:00 To: 9:00:00
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Municipality: Gananoque Site #: 1315400001 Intersection: Stone St & South St TFR File #: 6 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
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** Non-Signalized Intersection **	Major Road: Stone St runs N/S
--	--------------------------------------

North Leg Total: 28 North Entering: 13 North Peds: 10 Peds Cross: \times	<table style="margin: auto;"> <tr> <td style="text-align: right;">Cyclists</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td rowspan="4" style="font-size: 2em; vertical-align: middle;">↑</td> <td style="text-align: left;">Cyclists</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Trucks</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: center;">0</td> <td style="text-align: center;">13</td> <td style="text-align: center;">13</td> <td style="text-align: left;">Cars</td> <td style="text-align: center;">15</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: center;">0</td> <td style="text-align: center;">13</td> <td style="text-align: center;">13</td> <td style="text-align: left;">Totals</td> <td style="text-align: center;">15</td> </tr> </table>	Cyclists	0	0	0	↑	Cyclists	0	Trucks	0	0	0	Trucks	0	Cars	0	13	13	Cars	15	Totals	0	13	13	Totals	15	East Leg Total: 28 East Entering: 15 East Peds: 0 Peds Cross: \times	
Cyclists	0	0	0	↑	Cyclists		0																					
Trucks	0	0	0		Trucks		0																					
Cars	0	13	13		Cars		15																					
Totals	0	13	13		Totals	15																						
<table style="margin: auto;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: center;">15</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td rowspan="2" style="font-size: 2em; vertical-align: middle;">↑</td> <td style="text-align: left;">Cars</td> <td style="text-align: center;">15</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Trucks</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Cyclists</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td rowspan="2" style="font-size: 2em; vertical-align: middle;">↓</td> <td style="text-align: left;">Cyclists</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: center;">15</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Totals</td> <td style="text-align: center;">15</td> </tr> </table>			Cars	15	0	0	↑	Cars	15	Trucks	0	0	0	Trucks	0	Cyclists	0	0	0	↓	Cyclists	0	Totals	15	0	0	Totals	15
Cars	15	0	0	↑	Cars	15																						
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<table style="margin: auto;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: center;">13</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td rowspan="4" style="font-size: 2em; vertical-align: middle;">↓</td> <td style="text-align: left;">Cars</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Trucks</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Cyclists</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Cyclists</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: center;">13</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Totals</td> <td style="text-align: center;">13</td> </tr> </table>			Cars	13	0	0	↓	Cars	0	Trucks	0	0	0	Trucks	0	Cyclists	0	0	0	Cyclists	0	Totals	13	0	0	Totals	13	
Cars	13	0	0	↓	Cars	0																						
Trucks	0	0	0		Trucks	0																						
Cyclists	0	0	0		Cyclists	0																						
Totals	13	0	0		Totals	13																						
<table style="margin: auto;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td rowspan="4" style="font-size: 2em; vertical-align: middle;">↓</td> <td style="text-align: left;">Cars</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Trucks</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Cyclists</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Cyclists</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: left;">Totals</td> <td style="text-align: center;">0</td> </tr> </table>			Cars	0	0	0	↓	Cars	0	Trucks	0	0	0	Trucks	0	Cyclists	0	0	0	Cyclists	0	Totals	0	0	0	Totals	0	
Cars	0	0	0	↓	Cars	0																						
Trucks	0	0	0		Trucks	0																						
Cyclists	0	0	0		Cyclists	0																						
Totals	0	0	0		Totals	0																						
<table style="margin: auto;"> <tr> <td style="text-align: right;">Peds Cross:</td> <td style="text-align: center;">\times</td> </tr> <tr> <td style="text-align: right;">South Peds:</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: right;">South Entering:</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">South Leg Total:</td> <td style="text-align: center;">0</td> </tr> </table>			Peds Cross:	\times	South Peds:	1	South Entering:	0	South Leg Total:	0																		
Peds Cross:	\times																											
South Peds:	1																											
South Entering:	0																											
South Leg Total:	0																											

Comments



Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:00:00 To: 17:00:00
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Municipality: Gananoque Site #: 1315400001 Intersection: Stone St & South St TFR File #: 6 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
---	---

** Non-Signalized Intersection **	Major Road: Stone St runs N/S
--	--------------------------------------

North Leg Total: 57 North Entering: 37 North Peds: 4 Peds Cross: \times	<table style="margin: auto;"> <tr> <td style="padding: 5px;">Cyclists</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td rowspan="5" style="text-align: center; vertical-align: middle; padding: 10px;"> </td> <td style="padding: 5px;">Cyclists</td> <td style="padding: 5px;">1</td> </tr> <tr> <td style="padding: 5px;">Trucks</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">Trucks</td> <td style="padding: 5px;">1</td> </tr> <tr> <td style="padding: 5px;">Cars</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">32</td> <td style="padding: 5px;">35</td> <td style="padding: 5px;">Cars</td> <td style="padding: 5px;">18</td> </tr> <tr> <td style="padding: 5px;">Totals</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">33</td> <td></td> <td style="padding: 5px;">Totals</td> <td style="padding: 5px;">20</td> </tr> <tr> <td colspan="3"></td> <td style="padding: 5px;">Stone St</td> <td colspan="2"></td> </tr> </table>	Cyclists	1	1	2		Cyclists	1	Trucks	0	0	0	Trucks	1	Cars	3	32	35	Cars	18	Totals	4	33		Totals	20				Stone St			East Leg Total: 51 East Entering: 17 East Peds: 8 Peds Cross: \times
Cyclists	1	1	2		Cyclists		1																										
Trucks	0	0	0		Trucks		1																										
Cars	3	32	35		Cars		18																										
Totals	4	33			Totals		20																										
			Stone St																														
<table style="margin: auto;"> <tr> <td style="padding: 5px;">Cars</td> <td style="padding: 5px;">Trucks</td> <td style="padding: 5px;">Cyclists</td> <td style="padding: 5px;">Totals</td> </tr> <tr> <td style="padding: 5px;">16</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">17</td> </tr> <tr> <td style="padding: 5px;">0</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">0</td> </tr> <tr> <td style="padding: 5px;">16</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">0</td> <td></td> </tr> </table> <p style="text-align: center;">South St </p> <table style="margin: auto;"> <tr> <td style="padding: 5px;">Cars</td> <td style="padding: 5px;">Trucks</td> <td style="padding: 5px;">Cyclists</td> <td style="padding: 5px;">Totals</td> </tr> <tr> <td style="padding: 5px;">33</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">34</td> </tr> </table>			Cars	Trucks	Cyclists	Totals	16	1	0	17	0	0	0	0	16	1	0		Cars	Trucks	Cyclists	Totals	33	0	1	34							
Cars	Trucks	Cyclists	Totals																														
16	1	0	17																														
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Cars	Trucks	Cyclists	Totals																														
33	0	1	34																														
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Cars 3 Trucks 0 Cyclists 1 Totals 4	<table style="margin: auto;"> <tr> <td style="padding: 5px;">Cars</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">3</td> </tr> <tr> <td style="padding: 5px;">Trucks</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">0</td> </tr> <tr> <td style="padding: 5px;">Cyclists</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">1</td> </tr> <tr> <td style="padding: 5px;">Totals</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">1</td> <td></td> </tr> </table>	Cars	2	1	3	Trucks	0	0	0	Cyclists	1	0	1	Totals	3	1																	
Cars	2	1	3																														
Trucks	0	0	0																														
Cyclists	1	0	1																														
Totals	3	1																															
<table style="width: 100%;"> <tr> <td style="width: 50%; padding: 5px;">Peds Cross: \times</td> <td style="width: 50%; padding: 5px;">South Peds: 0</td> </tr> <tr> <td style="padding: 5px;">South Entering: 4</td> <td style="padding: 5px;">South Leg Total: 8</td> </tr> </table>			Peds Cross: \times	South Peds: 0	South Entering: 4	South Leg Total: 8																											
Peds Cross: \times	South Peds: 0																																
South Entering: 4	South Leg Total: 8																																

Comments




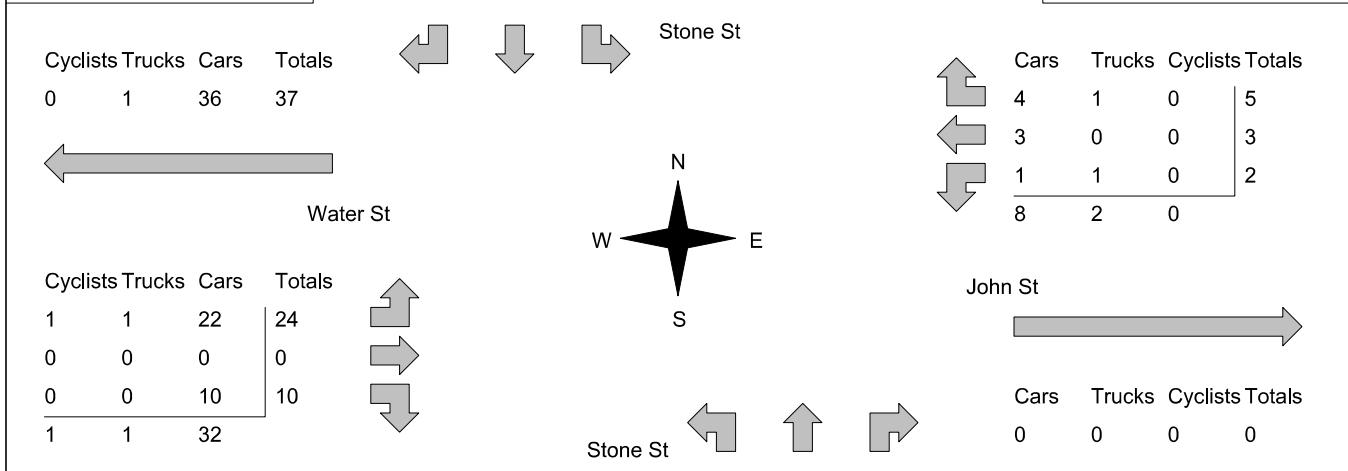
Accu-Traffic Inc.


Morning Peak Diagram	Specified Period	One Hour Peak
	From: 7:00:00 To: 9:00:00	From: 7:45:00 To: 8:45:00

Municipality: Gananoque Site #: 1315400002 Intersection: Stone St & Water St TFR File #: 7 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
---	---

** Signalized Intersection **	Major Road: Stone St runs N/S
--------------------------------------	--------------------------------------

North Leg Total: 79 North Entering: 35 North Peds: 4 Peds Cross: ☒	<table border="1"> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>Cars</td><td>23</td><td>11</td><td>0</td><td>34</td></tr> <tr><td>Totals</td><td>24</td><td>11</td><td>0</td><td></td></tr> </table>	Cyclists	0	0	0	0	Trucks	1	0	0	1	Cars	23	11	0	34	Totals	24	11	0		 <table border="1"> <tr><td>Cyclists</td><td>1</td></tr> <tr><td>Trucks</td><td>2</td></tr> <tr><td>Cars</td><td>41</td></tr> <tr><td>Totals</td><td>44</td></tr> </table>	Cyclists	1	Trucks	2	Cars	41	Totals	44	East Leg Total: 10 East Entering: 10 East Peds: 5 Peds Cross: ☒
Cyclists	0	0	0	0																											
Trucks	1	0	0	1																											
Cars	23	11	0	34																											
Totals	24	11	0																												
Cyclists	1																														
Trucks	2																														
Cars	41																														
Totals	44																														



Peds Cross: ☒ West Peds: 10 West Entering: 34 West Leg Total: 71	<table border="1"> <tr><td>Cars</td><td>22</td></tr> <tr><td>Trucks</td><td>1</td></tr> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Totals</td><td>23</td></tr> </table>	Cars	22	Trucks	1	Cyclists	0	Totals	23	 <table border="1"> <tr><td>Cars</td><td>10</td><td>15</td><td>0</td><td>25</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>10</td><td>15</td><td>0</td><td></td></tr> </table>	Cars	10	15	0	25	Trucks	0	0	0	0	Cyclists	0	0	0	0	Totals	10	15	0		Peds Cross: ☒ South Peds: 6 South Entering: 25 South Leg Total: 48
Cars	22																														
Trucks	1																														
Cyclists	0																														
Totals	23																														
Cars	10	15	0	25																											
Trucks	0	0	0	0																											
Cyclists	0	0	0	0																											
Totals	10	15	0																												

Comments



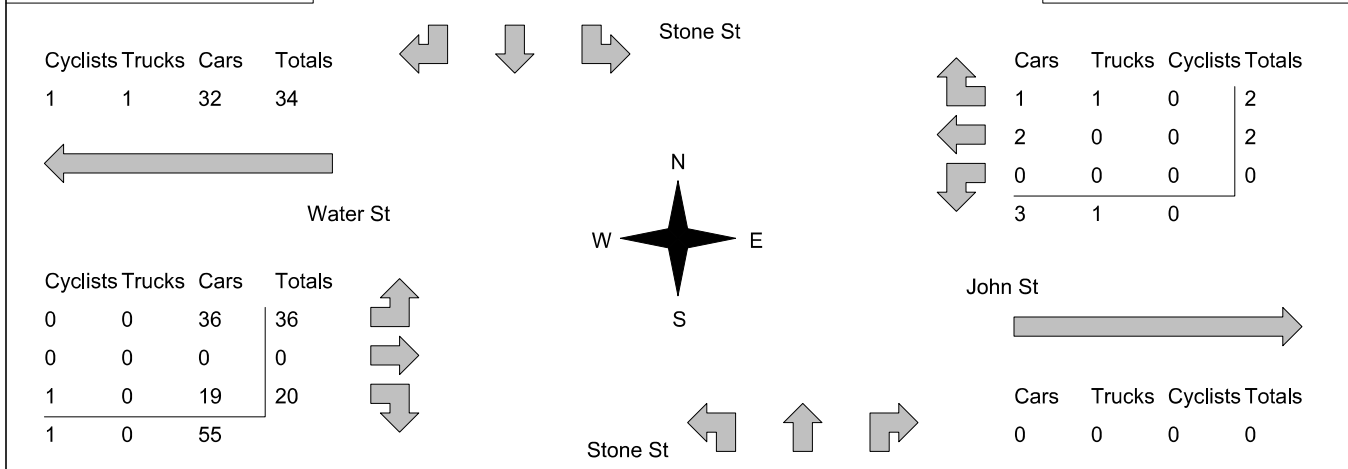
Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:00:00 To: 17:00:00
-------------------------------	---	--

Municipality: Gananoque Site #: 1315400002 Intersection: Stone St & Water St TFR File #: 7 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
---	---

** Signalized Intersection **	Major Road: Stone St runs N/S
--------------------------------------	--------------------------------------

North Leg Total: 106 North Entering: 48 North Peds: 3 Peds Cross: \bowtie	<table style="border-collapse: collapse; margin: auto;"> <tr><td>Cyclists</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cars</td><td>18</td><td>29</td><td>0</td><td>47</td></tr> <tr style="border-top: 1px solid black;"><td>Totals</td><td>19</td><td>29</td><td>0</td><td></td></tr> </table>	Cyclists	1	0	0	1	Trucks	0	0	0	0	Cars	18	29	0	47	Totals	19	29	0			Cyclists 0 Trucks 1 Cars 57 Totals 58	East Leg Total: 4 East Entering: 4 East Peds: 7 Peds Cross: \bowtie
Cyclists	1	0	0	1																				
Trucks	0	0	0	0																				
Cars	18	29	0	47																				
Totals	19	29	0																					



Peds Cross: \bowtie West Peds: 17 West Entering: 56 West Leg Total: 90	<table style="border-collapse: collapse; margin: auto;"> <tr><td>Cars</td><td>48</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cyclists</td><td>1</td></tr> <tr style="border-top: 1px solid black;"><td>Totals</td><td>49</td></tr> </table>	Cars	48	Trucks	0	Cyclists	1	Totals	49		<table style="border-collapse: collapse; margin: auto;"> <tr><td>Cars</td><td>12</td><td>20</td><td>0</td><td>32</td></tr> <tr><td>Trucks</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr style="border-top: 1px solid black;"><td>Totals</td><td>13</td><td>20</td><td>0</td><td></td></tr> </table>	Cars	12	20	0	32	Trucks	1	0	0	1	Cyclists	0	0	0	0	Totals	13	20	0		Peds Cross: \bowtie South Peds: 5 South Entering: 33 South Leg Total: 82
Cars	48																															
Trucks	0																															
Cyclists	1																															
Totals	49																															
Cars	12	20	0	32																												
Trucks	1	0	0	1																												
Cyclists	0	0	0	0																												
Totals	13	20	0																													

Comments



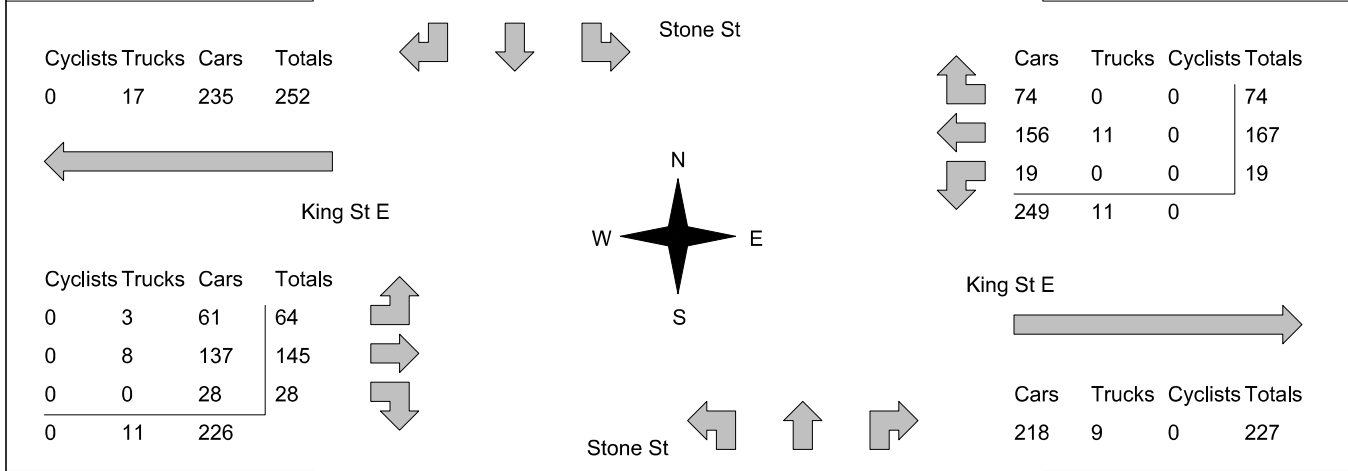
Accu-Traffic Inc.

Morning Peak Diagram	Specified Period From: 7:00:00 To: 9:00:00	One Hour Peak From: 7:30:00 To: 8:30:00
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Municipality: Gananoque Site #: 1315400003 Intersection: King St E & Stone St TFR File #: 8 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
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** Signalized Intersection **	Major Road: King St E runs W/E
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North Leg Total: 365 North Entering: 175 North Peds: 9 Peds Cross: \bowtie	<table style="margin: auto;"> <tr><td>Cyclists</td><td>0</td><td>2</td><td>0</td><td>2</td></tr> <tr><td>Trucks</td><td>5</td><td>3</td><td>1</td><td>9</td></tr> <tr><td>Cars</td><td>64</td><td>39</td><td>61</td><td>164</td></tr> <tr><td>Totals</td><td>69</td><td>44</td><td>62</td><td></td></tr> </table>	Cyclists	0	2	0	2	Trucks	5	3	1	9	Cars	64	39	61	164	Totals	69	44	62			Cyclists 2 Trucks 6 Cars 182 Totals 190	East Leg Total: 487 East Entering: 260 East Peds: 8 Peds Cross: \bowtie
Cyclists	0	2	0	2																				
Trucks	5	3	1	9																				
Cars	64	39	61	164																				
Totals	69	44	62																					



Peds Cross: \bowtie West Peds: 12 West Entering: 237 West Leg Total: 489	<table style="margin: auto;"> <tr><td>Cars</td><td>86</td><td>Cars</td><td>15</td><td>47</td><td>20</td><td>82</td></tr> <tr><td>Trucks</td><td>3</td><td>Trucks</td><td>1</td><td>3</td><td>0</td><td>4</td></tr> <tr><td>Cyclists</td><td>2</td><td>Cyclists</td><td>0</td><td>2</td><td>0</td><td>2</td></tr> <tr><td>Totals</td><td>91</td><td>Totals</td><td>16</td><td>52</td><td>20</td><td></td></tr> </table>	Cars	86	Cars	15	47	20	82	Trucks	3	Trucks	1	3	0	4	Cyclists	2	Cyclists	0	2	0	2	Totals	91	Totals	16	52	20			Peds Cross: \bowtie South Peds: 4 South Entering: 88 South Leg Total: 179
Cars	86	Cars	15	47	20	82																									
Trucks	3	Trucks	1	3	0	4																									
Cyclists	2	Cyclists	0	2	0	2																									
Totals	91	Totals	16	52	20																										

Comments



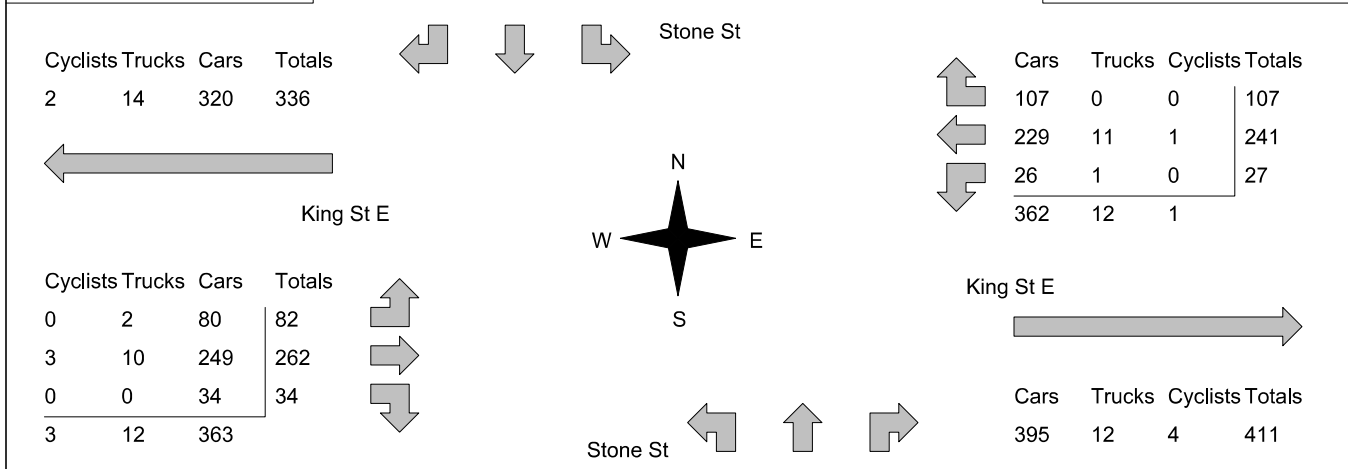
Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:00:00 To: 17:00:00
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Municipality: Gananoque Site #: 1315400003 Intersection: King St E & Stone St TFR File #: 8 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
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** Signalized Intersection **	Major Road: King St E runs W/E
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North Leg Total: 457 North Entering: 219 North Peds: 8 Peds Cross: \bowtie	<table style="margin: auto;"> <tr><td>Cyclists</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>Trucks</td><td>1</td><td>0</td><td>2</td><td>3</td></tr> <tr><td>Cars</td><td>69</td><td>47</td><td>99</td><td>215</td></tr> <tr><td>Totals</td><td>70</td><td>47</td><td>102</td><td></td></tr> </table>	Cyclists	0	0	1	1	Trucks	1	0	2	3	Cars	69	47	99	215	Totals	70	47	102			Cyclists 0 Trucks 3 Cars 235 Totals 238	East Leg Total: 786 East Entering: 375 East Peds: 39 Peds Cross: \bowtie
Cyclists	0	0	1	1																				
Trucks	1	0	2	3																				
Cars	69	47	99	215																				
Totals	70	47	102																					



Peds Cross: \bowtie West Peds: 19 West Entering: 378 West Leg Total: 714	<table style="margin: auto;"> <tr><td>Cars</td><td>107</td><td>22</td><td>48</td><td>47</td><td>117</td></tr> <tr><td>Trucks</td><td>1</td><td>2</td><td>1</td><td>0</td><td>3</td></tr> <tr><td>Cyclists</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>Totals</td><td>108</td><td>25</td><td>49</td><td>47</td><td></td></tr> </table>	Cars	107	22	48	47	117	Trucks	1	2	1	0	3	Cyclists	0	1	0	0	1	Totals	108	25	49	47			Peds Cross: \bowtie South Peds: 32 South Entering: 121 South Leg Total: 229
Cars	107	22	48	47	117																						
Trucks	1	2	1	0	3																						
Cyclists	0	1	0	0	1																						
Totals	108	25	49	47																							

Comments



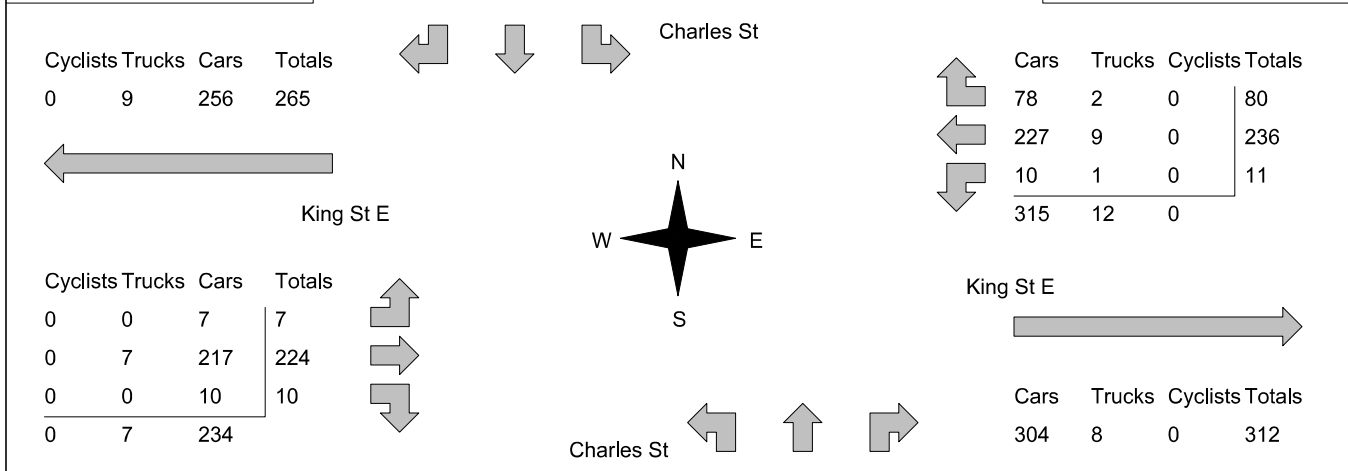
Accu-Traffic Inc.

Morning Peak Diagram	Specified Period From: 7:00:00 To: 9:00:00	One Hour Peak From: 7:45:00 To: 8:45:00
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Municipality: Gananoque Site #: 1315400004 Intersection: King St E & Charles St TFR File #: 12 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
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** Signalized Intersection **	Major Road: King St E runs W/E
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North Leg Total: 224 North Entering: 110 North Peds: 11 Peds Cross: \bowtie	<table style="margin: auto;"> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td><td>2</td><td>0</td><td>2</td></tr> <tr><td>Cars</td><td>19</td><td>18</td><td>71</td><td>108</td></tr> <tr><td>Totals</td><td>19</td><td>20</td><td>71</td><td></td></tr> </table>	Cyclists	0	0	0	0	Trucks	0	2	0	2	Cars	19	18	71	108	Totals	19	20	71			<table style="margin: auto;"> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Trucks</td><td>2</td></tr> <tr><td>Cars</td><td>112</td></tr> <tr><td>Totals</td><td>114</td></tr> </table>	Cyclists	0	Trucks	2	Cars	112	Totals	114	East Leg Total: 639 East Entering: 327 East Peds: 5 Peds Cross: \bowtie
Cyclists	0	0	0	0																												
Trucks	0	2	0	2																												
Cars	19	18	71	108																												
Totals	19	20	71																													
Cyclists	0																															
Trucks	2																															
Cars	112																															
Totals	114																															



Peds Cross: \bowtie West Peds: 9 West Entering: 241 West Leg Total: 506	<table style="margin: auto;"> <tr><td>Cars</td><td>38</td></tr> <tr><td>Trucks</td><td>3</td></tr> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Totals</td><td>41</td></tr> </table>	Cars	38	Trucks	3	Cyclists	0	Totals	41		<table style="margin: auto;"> <tr><td>Cars</td><td>10</td><td>27</td><td>16</td><td>53</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>10</td><td>27</td><td>17</td><td></td></tr> </table>	Cars	10	27	16	53	Trucks	0	0	1	1	Cyclists	0	0	0	0	Totals	10	27	17		Peds Cross: \bowtie South Peds: 4 South Entering: 54 South Leg Total: 95
Cars	38																															
Trucks	3																															
Cyclists	0																															
Totals	41																															
Cars	10	27	16	53																												
Trucks	0	0	1	1																												
Cyclists	0	0	0	0																												
Totals	10	27	17																													

Comments



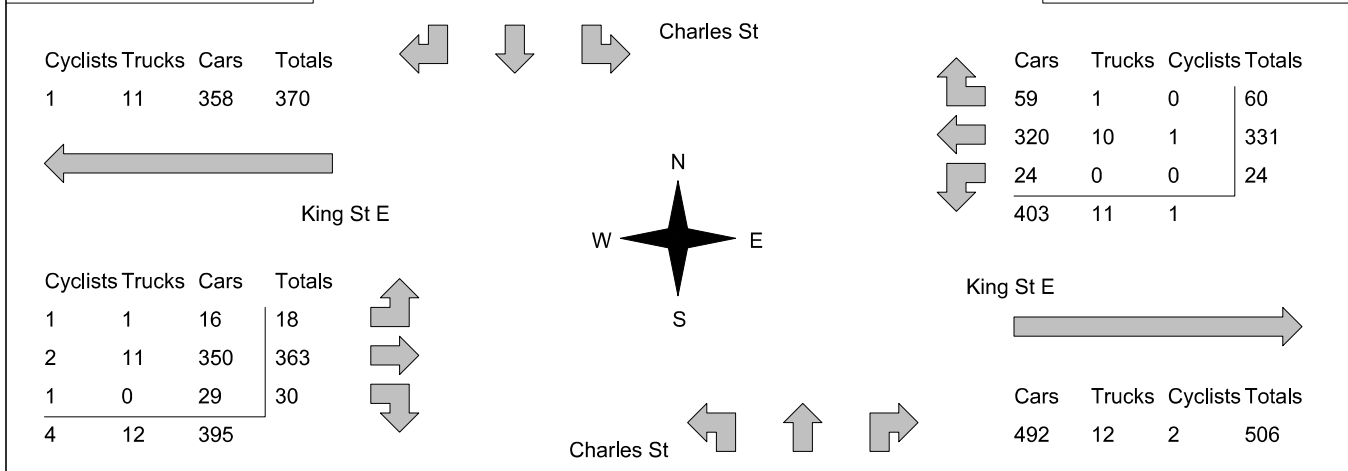
Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:00:00 To: 17:00:00
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Municipality: Gananoque Site #: 1315400004 Intersection: King St E & Charles St TFR File #: 12 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
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** Signalized Intersection **	Major Road: King St E runs W/E
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North Leg Total: 268 North Entering: 177 North Peds: 6 Peds Cross: ⚡	<table border="1" style="border-collapse: collapse; margin: auto;"> <tr><td>Cyclists</td><td>0</td><td>3</td><td>0</td><td>3</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>Cars</td><td>31</td><td>18</td><td>124</td><td>173</td></tr> <tr><td>Totals</td><td>31</td><td>21</td><td>125</td><td></td></tr> </table>	Cyclists	0	3	0	3	Trucks	0	0	1	1	Cars	31	18	124	173	Totals	31	21	125			<table border="1" style="border-collapse: collapse; margin: auto;"> <tr><td>Cyclists</td><td>2</td></tr> <tr><td>Trucks</td><td>3</td></tr> <tr><td>Cars</td><td>86</td></tr> <tr><td>Totals</td><td>91</td></tr> </table>	Cyclists	2	Trucks	3	Cars	86	Totals	91	East Leg Total: 921 East Entering: 415 East Peds: 19 Peds Cross: ⚡
Cyclists	0	3	0	3																												
Trucks	0	0	1	1																												
Cars	31	18	124	173																												
Totals	31	21	125																													
Cyclists	2																															
Trucks	3																															
Cars	86																															
Totals	91																															



Peds Cross: ⚡ West Peds: 61 West Entering: 411 West Leg Total: 781	<table border="1" style="border-collapse: collapse; margin: auto;"> <tr><td>Cars</td><td>71</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cyclists</td><td>4</td></tr> <tr><td>Totals</td><td>75</td></tr> </table>	Cars	71	Trucks	0	Cyclists	4	Totals	75		<table border="1" style="border-collapse: collapse; margin: auto;"> <tr><td>Cars</td><td>7</td><td>11</td><td>18</td><td>36</td></tr> <tr><td>Trucks</td><td>1</td><td>1</td><td>0</td><td>2</td></tr> <tr><td>Cyclists</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>Totals</td><td>8</td><td>13</td><td>18</td><td></td></tr> </table>	Cars	7	11	18	36	Trucks	1	1	0	2	Cyclists	0	1	0	1	Totals	8	13	18		Peds Cross: ⚡ South Peds: 60 South Entering: 39 South Leg Total: 114
Cars	71																															
Trucks	0																															
Cyclists	4																															
Totals	75																															
Cars	7	11	18	36																												
Trucks	1	1	0	2																												
Cyclists	0	1	0	1																												
Totals	8	13	18																													

Comments



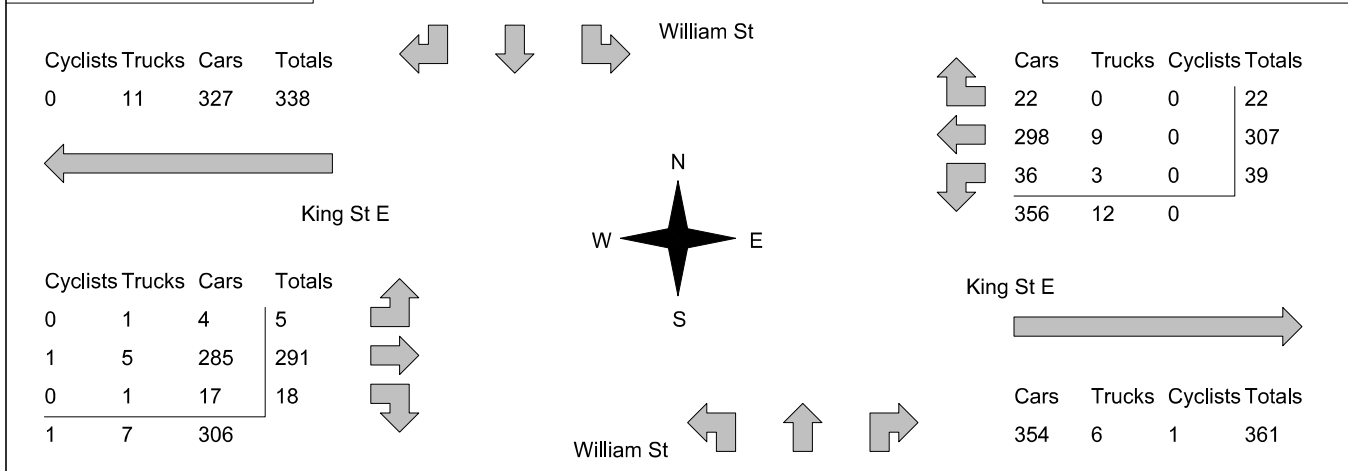
Accu-Traffic Inc.

Morning Peak Diagram	Specified Period From: 7:00:00 To: 9:00:00	One Hour Peak From: 7:45:00 To: 8:45:00
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Municipality: Gananoque Site #: 1315400005 Intersection: King St E & William St TFR File #: 13 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
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** Signalized Intersection **	Major Road: King St E runs W/E
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North Leg Total: 112 North Entering: 66 North Peds: 10 Peds Cross: \times	<table border="1" style="font-size: small;"> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>Cars</td><td>8</td><td>17</td><td>40</td><td>65</td></tr> <tr><td>Totals</td><td>8</td><td>18</td><td>40</td><td></td></tr> </table>	Cyclists	0	0	0	0	Trucks	0	1	0	1	Cars	8	17	40	65	Totals	8	18	40			<table border="1" style="font-size: small;"> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Trucks</td><td>1</td></tr> <tr><td>Cars</td><td>45</td></tr> <tr><td>Totals</td><td>46</td></tr> </table>	Cyclists	0	Trucks	1	Cars	45	Totals	46	East Leg Total: 729 East Entering: 368 East Peds: 28 Peds Cross: \times
Cyclists	0	0	0	0																												
Trucks	0	1	0	1																												
Cars	8	17	40	65																												
Totals	8	18	40																													
Cyclists	0																															
Trucks	1																															
Cars	45																															
Totals	46																															



Peds Cross: \times West Peds: 2 West Entering: 314 West Leg Total: 652	<table border="1" style="font-size: small;"> <tr><td>Cars</td><td>70</td></tr> <tr><td>Trucks</td><td>5</td></tr> <tr><td>Cyclists</td><td>0</td></tr> <tr><td>Totals</td><td>75</td></tr> </table>	Cars	70	Trucks	5	Cyclists	0	Totals	75		<table border="1" style="font-size: small;"> <tr><td>Cars</td><td>21</td><td>19</td><td>29</td><td>69</td></tr> <tr><td>Trucks</td><td>2</td><td>0</td><td>1</td><td>3</td></tr> <tr><td>Cyclists</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>23</td><td>19</td><td>30</td><td></td></tr> </table>	Cars	21	19	29	69	Trucks	2	0	1	3	Cyclists	0	0	0	0	Totals	23	19	30		Peds Cross: \times South Peds: 5 South Entering: 72 South Leg Total: 147
Cars	70																															
Trucks	5																															
Cyclists	0																															
Totals	75																															
Cars	21	19	29	69																												
Trucks	2	0	1	3																												
Cyclists	0	0	0	0																												
Totals	23	19	30																													

Comments



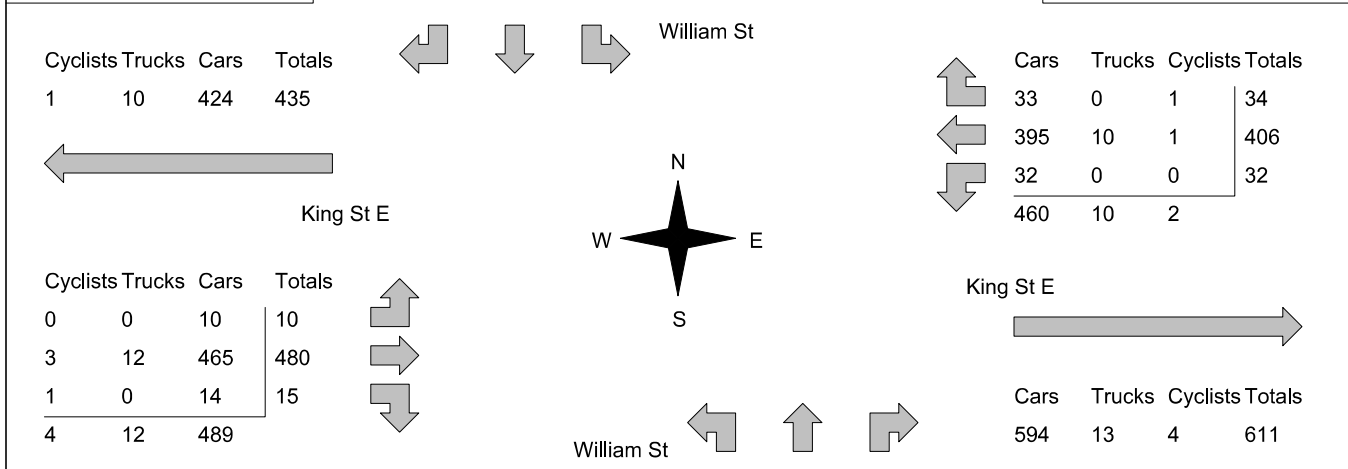
Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:00:00 To: 17:00:00
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Municipality: Gananoque Site #: 1315400005 Intersection: King St E & William St TFR File #: 13 Count date: 24-Sep-13	Weather conditions: Person(s) who counted:
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** Signalized Intersection **	Major Road: King St E runs W/E
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North Leg Total: 163 North Entering: 90 North Peds: 18 Peds Cross: \times	<table style="margin: auto;"> <tr><td>Cyclists</td><td>0</td><td>3</td><td>0</td><td>3</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cars</td><td>11</td><td>18</td><td>58</td><td>87</td></tr> <tr><td>Totals</td><td>11</td><td>21</td><td>58</td><td></td></tr> </table>	Cyclists	0	3	0	3	Trucks	0	0	0	0	Cars	11	18	58	87	Totals	11	21	58			<table style="margin: auto;"> <tr><td>Cyclists</td><td>3</td></tr> <tr><td>Trucks</td><td>1</td></tr> <tr><td>Cars</td><td>69</td></tr> <tr><td>Totals</td><td>73</td></tr> </table>	Cyclists	3	Trucks	1	Cars	69	Totals	73	East Leg Total: 1083 East Entering: 472 East Peds: 33 Peds Cross: \times
Cyclists	0	3	0	3																												
Trucks	0	0	0	0																												
Cars	11	18	58	87																												
Totals	11	21	58																													
Cyclists	3																															
Trucks	1																															
Cars	69																															
Totals	73																															



Peds Cross: \times West Peds: 11 West Entering: 505 West Leg Total: 940	<table style="margin: auto;"> <tr><td>Cars</td><td>64</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cyclists</td><td>4</td></tr> <tr><td>Totals</td><td>68</td></tr> </table>	Cars	64	Trucks	0	Cyclists	4	Totals	68		<table style="margin: auto;"> <tr><td>Cars</td><td>18</td><td>26</td><td>71</td><td>115</td></tr> <tr><td>Trucks</td><td>0</td><td>1</td><td>1</td><td>2</td></tr> <tr><td>Cyclists</td><td>0</td><td>2</td><td>1</td><td>3</td></tr> <tr><td>Totals</td><td>18</td><td>29</td><td>73</td><td></td></tr> </table>	Cars	18	26	71	115	Trucks	0	1	1	2	Cyclists	0	2	1	3	Totals	18	29	73		Peds Cross: \times South Peds: 25 South Entering: 120 South Leg Total: 188
Cars	64																															
Trucks	0																															
Cyclists	4																															
Totals	68																															
Cars	18	26	71	115																												
Trucks	0	1	1	2																												
Cyclists	0	2	1	3																												
Totals	18	29	73																													

Comments



SIGNAL TIMING PLAN (Tourist Season)

LOCATION: King St and Charles St Gananoque Ontario

MODE of OPERATION: Fixed (Time Based Coordination)

TIMING DEVELOPED BY: Signalcorps

DATE TIMING DEVELOPED: June 2, 2011

CONTROLLER TIMING DATA

MOVEMENT (FAZE)

PHASE	King St EB/WB			Charles St N/S				
	1	2	3	4	5	6	7	8
MIN GREEN	-	27	-	24	-	-	-	-
BIKE GREEN	-	-	-	-	-	-	-	-
CS MGRN	-	-	-	-	-	-	-	-
WALK	-	11	-	8	-	-	-	-
PEDESTRIAN CLEARANCE	-	16	-	16	-	-	-	-
VEHICLE EXTENSION	-	-	-	-	-	-	-	-
VEHICLE EXTENSION 2	-	-	-	-	-	-	-	-
MAX EXTENSION	-	-	-	-	-	-	-	-
MAX 1	-	71	-	29	-	-	-	-
MAX 2	-	33	-	28	-	-	-	-
MAX 3	-	-	-	-	-	-	-	-
DET MAX	-	-	-	-	-	-	-	-
YELLOW	-	3	-	3	-	-	-	-
RED CLEAR	-	2	-	2	-	-	-	-
RED REVERT	-	2	-	2	-	-	-	-
ACT B4	-	-	-	-	-	-	-	-
SEC/ACT	-	-	-	-	-	-	-	-
MAX INI	-	-	-	-	-	-	-	-
TIME B4 INIT	-	-	-	-	-	-	-	-
CARS WT	-	-	-	-	-	-	-	-
TT REDUC	-	-	-	-	-	-	-	-
MIN GAP	-	-	-	-	-	-	-	-

COORDINATED PATTERN 1**TS2 FORMAT**

TIMING PLAN: AM (0800-1145) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 35

SPLITS

PHASE 1	-	PHASE 2	71	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING(1)	0	(2)	0	
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 2**TS2 FORMAT**

TIMING PLAN: MIDDAY (1145-1615) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 11

SPLITS

PHASE 1	-	PHASE 2	71	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RIN	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 3

TS2 FORMAT

TIMING PLAN: PM (1615-1800) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 3

SPLITS

PHASE 1	-	PHASE 2	71	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 4

TS2 FORMAT

TIMING PLAN: WEEKEND (0800-1800) Sat-Sun

CYCLE LENGTH: 100

OFFSETS: 11

SPLITS

PHASE 1	-	PHASE 2	71	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 5**TS2 FORMAT (NO CHANGE)**

TIMING PLAN: OFF PEAK (1800-0800) Mon-Fri

CYCLE LENGTH: 61

OFFSETS: RECALL

SPLITS

PHASE 1	-	PHASE 2	33	PHASE 3	-	PHASE 4	28
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 6**TS2 FORMAT (NO CHANGE)**

TIMING PLAN: OFF PEAK (1800-0800) Sat-Sun

CYCLE LENGTH: 61

OFFSETS: RECALL

SPLITS

PHASE 1	-	PHASE 2	33	PHASE 3	-	PHASE 4	28
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-



SIGNAL TIMING PLAN (Tourist Season)

LOCATION: King St and Stone St Gananoque Ontario

MODE of OPERATION: Fixed (Time Based Coordination)

TIMING DEVELOPED BY: Signalcorps

DATE TIMING DEVELOPED: June 2, 2011

CONTROLLER TIMING DATA

MOVEMENT (FAZE)

PHASE	King St			Stone St					
	EW/LT	EB/WB	NS/LT	N/S	4	5	6	7	8
MIN GREEN	6	27	5	24	-	-	-	-	-
BIKE GREEN	-	-	-	-	-	-	-	-	-
CS MGRN	-	-	-	-	-	-	-	-	-
WALK	-	13	-	7	-	-	-	-	-
PEDESTRIAN CLEARANCE	-	14	-	17	-	-	-	-	-
VEHICLE EXTENSION	-	-	-	-	-	-	-	-	-
VEHICLE EXTENSION 2	-	-	-	-	-	-	-	-	-
MAX EXTENSION	-	-	-	-	-	-	-	-	-
MAX 1	10	52	9	29	-	-	-	-	-
MAX 2	-	32	-	29	-	-	-	-	-
MAX 3	-	-	-	-	-	-	-	-	-
DET MAX	-	-	-	-	-	-	-	-	-
YELLOW	4	3	4	3	-	-	-	-	-
RED CLEAR	-	2	-	2	-	-	-	-	-
RED REVERT	-	2	-	2	-	-	-	-	-
ACT B4	-	-	-	-	-	-	-	-	-
SEC/ACT	-	-	-	-	-	-	-	-	-
MAX INI	-	-	-	-	-	-	-	-	-
TIME B4 INIT	-	-	-	-	-	-	-	-	-
CARS WT	-	-	-	-	-	-	-	-	-
TT REDUC	-	-	-	-	-	-	-	-	-
MIN GAP	-	-	-	-	-	-	-	-	-

COORDINATED PATTERN 1**TS2 FORMAT**

TIMING PLAN: AM (0800-1145) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 69

SPLITS

PHASE 1	10	PHASE 2	52	PHASE 3	9	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING(1)	0	(2)	0	
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	X	X	X	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 2**TS2 FORMAT**

TIMING PLAN: MIDDAY (1145-1615) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 47

SPLITS

PHASE 1	10	PHASE 2	52	PHASE 3	9	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RIN	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	X	X	X	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 3**TS2 FORMAT**

TIMING PLAN: PM (1615-1800) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 31

SPLITS

PHASE 1	10	PHASE 2	52	PHASE 3	9	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	X	X	X	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 4**TS2 FORMAT**

TIMING PLAN: WEEKEND (0800-1800) Sat-Sun

CYCLE LENGTH: 100

OFFSETS: 46

SPLITS

PHASE 1	10	PHASE 2	52	PHASE 3	9	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	X	X	X	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 5**TS2 FORMAT (NO CHANGE)**

TIMING PLAN: OFF PEAK (1800-0800) Mon-Fri

CYCLE LENGTH: 61

OFFSETS: RECALL

SPLITS

PHASE 1	-	PHASE 2	32	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	X	-	X	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 6**TS2 FORMAT (NO CHANGE)**

TIMING PLAN: OFF PEAK (1800-0800) Sat-Sun

CYCLE LENGTH: 61

OFFSETS: RECALL

SPLITS

PHASE 1	-	PHASE 2	32	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	X	-	X	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-



SIGNAL TIMING PLAN (Tourist Season)

LOCATION: King St and William St Gananoque Ontario

MODE of OPERATION: Fixed (Time Based Coordination)

TIMING DEVELOPED BY: Signalcorps

DATE TIMING DEVELOPED: June 2, 2011

CONTROLLER TIMING DATA

MOVEMENT (FAZE)

PHASE	King St EB/WB			William St N/S				
	1	2	3	4	5	6	7	8
MIN GREEN	-	29	-	22	-	-	-	-
BIKE GREEN	-	-	-	-	-	-	-	-
CS MGRN	-	-	-	-	-	-	-	-
WALK	-	16	-	7	-	-	-	-
PEDESTRIAN CLEARANCE	-	13	-	15	-	-	-	-
VEHICLE EXTENSION	-	-	-	-	-	-	-	-
VEHICLE EXTENSION 2	-	-	-	-	-	-	-	-
MAX EXTENSION	-	-	-	-	-	-	-	-
MAX 1	-	71	-	29	-	-	-	-
MAX 2	-	34	-	27	-	-	-	-
MAX 3	-	-	-	-	-	-	-	-
DET MAX	-	-	-	-	-	-	-	-
YELLOW	-	3	-	3	-	-	-	-
RED CLEAR	-	2	-	2	-	-	-	-
RED REVERT	-	2	-	2	-	-	-	-
ACT B4	-	-	-	-	-	-	-	-
SEC/ACT	-	-	-	-	-	-	-	-
MAX INI	-	-	-	-	-	-	-	-
TIME B4 INIT	-	-	-	-	-	-	-	-
CARS WT	-	-	-	-	-	-	-	-
TT REDUC	-	-	-	-	-	-	-	-
MIN GAP	-	-	-	-	-	-	-	-

COORDINATED PATTERN 1**TS2 FORMAT**

TIMING PLAN: AM (0800-1145) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 7

SPLITS

PHASE 1	-	PHASE 2	71	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING(1)	0	(2)	0	
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 2**TS2 FORMAT**

TIMING PLAN: MIDDAY (1145-1615) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 92

SPLITS

PHASE 1	-	PHASE 2	71	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RIN	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 3

TS2 FORMAT

TIMING PLAN: PM (1615-1800) Mon-Fri

CYCLE LENGTH: 100

OFFSETS: 76

SPLITS

PHASE 1	-	PHASE 2	71	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 4

TS2 FORMAT

TIMING PLAN: WEEKEND (0800-1800) Sat-Sun

CYCLE LENGTH: 100

OFFSETS: 88

SPLITS

PHASE 1	-	PHASE 2	71	PHASE 3	-	PHASE 4	29
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 5**TS2 FORMAT (NO CHANGE)**

TIMING PLAN: OFF PEAK (1800-0800) Mon-Fri

CYCLE LENGTH: 61

OFFSETS: RECALL

SPLITS

PHASE 1	-	PHASE 2	34	PHASE 3	-	PHASE 4	27
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

COORDINATED PATTERN 6**TS2 FORMAT (NO CHANGE)**

TIMING PLAN: OFF PEAK (1800-0800) Sat-Sun

CYCLE LENGTH: 61

OFFSETS: RECALL

SPLITS

PHASE 1	-	PHASE 2	34	PHASE 3	-	PHASE 4	27
PHASE 5	-	PHASE 6	-	PHASE 7	-	PHASE 8	-

VEHICLE PERM	(1)	0	(2)	0
VEHICLE PERM 2 DISP	0			
PHASE RESERVICE	NO			
SPLIT EXTENSION RING	(1)	0	(2)	0
SPLIT DMD PATTERN	(1)	0	(2)	0
XARTERY PATTERN	0			

PHASE NUMBER	1	2	3	4	5	6	7	8
COORDINATED PHASES	-	X	-	-	-	-	-	-
VEHICLE RECALL	-	-	-	-	-	-	-	-
VEHICLE MAX RECALL	-	X	-	X	-	-	-	-
PED RECALL	-	X	-	X	-	-	-	-
PHASE OMIT	-	-	-	-	-	-	-	-
SPARE	-	-	-	-	-	-	-	-

ALTERNATE SEQUENCE	A	B	C	D	E	F
	-	-	-	-	-	-

APPENDIX

B LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS AT SIGNALIZED INTERSECTIONS⁽¹⁾

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically for a 15-min analysis period. The criteria are given in the table below. Delay may be measured in the field or estimated using software such as Highway Capacity Software. Delay is a complex measure and is dependent upon a number of variables, including quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

Level of Service	Features	Control Delay per vehicle (sec)
A	LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	> 20 and ≤ 35
D	LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, of high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35 and ≤ 55
E	LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	> 55 and ≤ 80
F	LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	> 80

(1) Highway Capacity Manual 2000

LEVEL OF SERVICE DEFINITIONS AT UNSIGNALIZED INTERSECTIONS⁽¹⁾

The level of service criteria for unsignalized intersections are given in the table below. As used here, total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Level of Service	Features	Average Total Delay (sec/veh)
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.	≤ 10
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.	> 10 and ≤ 15
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.	> 15 and ≤ 25
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.	> 25 and ≤ 35
E	Very long traffic delays occur. Operations approach the capacity of the intersection.	> 35 and ≤ 50
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.	> 50

(1) Highway Capacity Manual 2000.

APPENDIX

C EXISTING INTERSECTION CAPACITY ANALYSIS

Lanes, Volumes, Timings
 1: South Street & Stone Street South

04/12/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	16	0	0	14	0
Future Volume (vph)	0	16	0	0	14	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1557	0	1800	0	0	1710
Flt Permitted						0.950
Satd. Flow (perm)	1557	0	1800	0	0	1710
Link Speed (k/h)	50		50		50	
Link Distance (m)	197.6		28.3		86.9	
Travel Time (s)	14.2		2.0		6.3	
Confl. Peds. (#/hr)	1	10				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	17	0	0	15	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	0	0	0	15
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

1: South Street & Stone Street South

04/12/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	16	0	0	14	0
Future Volume (Veh/h)	0	16	0	0	14	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	17	0	0	15	0
Pedestrians			1			10
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			1
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	31	10			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	31	10			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	978	1068			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	17	0	15
Volume Left	0	0	15
Volume Right	17	0	0
cSH	1068	1700	1636
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.4	0.0	0.2
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary			
Average Delay		7.9	
Intersection Capacity Utilization		16.2%	ICU Level of Service
Analysis Period (min)		15	A

Lanes, Volumes, Timings

2: Stone Street South & Water Street/John Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	11	3	4	6	11	16	0	0	12	25
Future Volume (vph)	25	0	11	3	4	6	11	16	0	0	12	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865		0.932							0.909
Flt Protected		0.950			0.989			0.980				
Satd. Flow (prot)	0	0	1557	0	1374	0	0	1764	0	0	1593	0
Flt Permitted		0.950			0.989			0.980				
Satd. Flow (perm)	0	0	1557	0	1374	0	0	1764	0	0	1593	0
Link Speed (k/h)		50			50			50				50
Link Distance (m)		59.4			97.0			86.9				528.8
Travel Time (s)		4.3			7.0			6.3				38.1
Confl. Peds. (#/hr)	4		6	6		4	10		5	5		10
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%	0%	50%	0%	20%	0%	0%	0%	0%	0%	4%
Adj. Flow (vph)	27	0	12	3	4	7	12	17	0	0	13	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	12	0	14	0	0	29	0	0	40	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

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

HCM Unsignalized Intersection Capacity Analysis

2: Stone Street South & Water Street/John Street

04/12/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	11	3	4	6	11	16	0	0	12	25
Future Volume (Veh/h)	25	0	11	3	4	6	11	16	0	0	12	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	0	12	3	4	7	12	17	0	0	13	27
Pedestrians		10			5			6			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	90	82	42	90	96	26	50			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	90	82	42	90	96	26	50			22		
tC, single (s)	7.1	6.5	6.2	7.6	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.0	4.0	3.5	2.2			2.2		
p0 queue free %	97	100	99	100	99	99	99			100		
cM capacity (veh/h)	856	795	1020	763	782	993	1556			1600		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	39	14	29	40								
Volume Left	27	3	12	0								
Volume Right	12	7	0	27								
cSH	901	869	1556	1700								
Volume to Capacity	0.04	0.02	0.01	0.02								
Queue Length 95th (m)	1.1	0.4	0.2	0.0								
Control Delay (s)	9.2	9.2	3.1	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.2	9.2	3.1	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			Err%	ICU Level of Service							H	
Analysis Period (min)			15									

Lanes, Volumes, Timings
3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	183	30	20	211	77	17	54	21	65	46	72
Future Volume (vph)	67	183	30	20	211	77	17	54	21	65	46	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.97	0.99		0.98	0.97	
Fr _t		0.979			0.960			0.958			0.909	
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	1668	0	1710	1623	0	1613	1632	0	1676	1476	0
Fl _t Permitted	0.496			0.577			0.652			0.704		
Satd. Flow (perm)	838	1668	0	1030	1623	0	1073	1632	0	1215	1476	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			25			18			74	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		96.1			200.4			528.8			53.5	
Travel Time (s)		6.9			14.4			38.1			3.9	
Confl. Peds. (#/hr)	9		4	4		9	12		8	8		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 (%)	5%	6%	0%	0%	7%	0%	6%	6%	0%	2%	7%	7%
Adj. Flow (vph)	73	199	33	22	229	84	18	59	23	71	50	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	232	0	22	313	0	18	82	0	71	128	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.15	0.29		0.04	0.40		0.05	0.20		0.18	0.31	
Control Delay	10.1	16.7		16.1	30.6		22.6	25.6		24.4	16.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.1	16.7		16.1	30.6		22.6	25.6		24.4	16.7	
LOS	B	B		B	C		C	C		C	B	
Approach Delay		15.1			29.7			25.0			19.5	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			C			C			B		
Queue Length 50th (m)	6.1	26.6		3.0	0.0		2.4	10.4		9.9	8.7	
Queue Length 95th (m)	12.4	43.7		m8.5	84.6		7.4	23.1		20.2	24.7	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	499	789		597	776		348	405		387	410	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.29		0.04	0.40		0.05	0.20		0.18	0.31	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 87 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 22.3
 Intersection LOS: C
 Intersection Capacity Utilization 58.3%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings
4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	8	283	11	12	297	84	11	29	18	74	21	20
Future Volume (vph)	8	283	11	12	297	84	11	29	18	74	21	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.99			0.99			0.99	
Frt		0.995			0.967			0.958			0.976	
Flt Protected		0.999		0.950				0.991			0.969	
Satd. Flow (prot)	0	1739	0	1569	1662	0	0	1662	0	0	1660	0
Flt Permitted		0.989		0.563				0.946			0.775	
Satd. Flow (perm)	0	1721	0	926	1662	0	0	1582	0	0	1320	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			30			20			10	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.4			204.6			117.4			55.1	
Travel Time (s)		14.4			14.7			8.5			4.0	
Confl. Peds. (#/hr)	11		4	4		11	9		5	5		9
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%	0%	9%	4%	3%	0%	0%	6%	0%	10%	0%
Adj. Flow (vph)	9	308	12	13	323	91	12	32	20	80	23	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	329	0	13	414	0	0	64	0	0	125	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	11.0	11.0		11.0	11.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio		0.66		0.66	0.66			0.24			0.24	
v/c Ratio		0.29		0.02	0.37			0.16			0.39	
Control Delay		9.5		4.6	5.2			23.5			33.4	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		9.5		4.6	5.2			23.5			33.4	
LOS		A		A	A			C			C	
Approach Delay		9.5			5.2			23.5			33.4	

Lanes, Volumes, Timings
 4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			C			C	
Queue Length 50th (m)		35.6		0.5	15.6			7.1				19.6
Queue Length 95th (m)		53.3		m1.5	22.5			18.2				37.3
Internal Link Dist (m)		176.4			180.6			93.4				31.1
Turn Bay Length (m)				60.0								
Base Capacity (vph)		1137		611	1107			394				324
Starvation Cap Reductn		0		0	0			0				0
Spillback Cap Reductn		0		0	0			0				0
Storage Cap Reductn		0		0	0			0				0
Reduced v/c Ratio		0.29		0.02	0.37			0.16				0.39

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 11.7
 Intersection LOS: B
 Intersection Capacity Utilization 51.6%
 ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Charles Street South & King Street



Lanes, Volumes, Timings
5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	367	19	41	387	23	24	20	32	42	19	9
Future Volume (vph)	6	367	19	41	387	23	24	20	32	42	19	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			0.96			0.96	
Frt		0.992			0.992			0.943			0.982	
Flt Protected	0.950			0.950				0.985			0.971	
Satd. Flow (prot)	1425	1745	0	1583	1733	0	0	1551	0	0	1683	0
Flt Permitted	0.457			0.475				0.905			0.806	
Satd. Flow (perm)	680	1745	0	788	1733	0	0	1423	0	0	1352	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			6			35			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		204.6			68.0			118.0			53.5	
Travel Time (s)		14.7			4.9			8.5			3.9	
Confl. Peds. (#/hr)	10		5	5		10	2		28	28		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	20%	2%	6%	8%	3%	0%	9%	0%	3%	0%	6%	0%
Adj. Flow (vph)	7	399	21	45	421	25	26	22	35	46	21	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	420	0	45	446	0	0	83	0	0	77	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	16.0	16.0		16.0	16.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	66.0	66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
v/c Ratio	0.02	0.36		0.09	0.39			0.23			0.23	
Control Delay	3.5	5.2		6.7	8.9			20.9			30.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.5	5.2		6.7	8.9			20.9			30.0	
LOS	A	A		A	A			C			C	
Approach Delay		5.1			8.7			20.9			30.0	

Lanes, Volumes, Timings
 5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			C			C	
Queue Length 50th (m)	0.3	23.7		3.0	36.9			7.7			11.5	
Queue Length 95th (m)	m1.0	33.1		7.1	54.8			20.6			24.6	
Internal Link Dist (m)		180.6			44.0			94.0			29.5	
Turn Bay Length (m)	85.0			25.0								
Base Capacity (vph)	448	1153		520	1145			368			329	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.36		0.09	0.39			0.23			0.23	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 9.7
 Intersection LOS: A
 Intersection Capacity Utilization 62.6%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: William Street South & King Street



Lanes, Volumes, Timings
7: South Street & Charles Street South

04/12/2018



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	0	0	0
Right Turn on Red	Yes	Yes	Yes			Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	499.5			197.6	203.6	
Travel Time (s)	36.0			14.2	14.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Turn Type						
Protected Phases						
Permitted Phases						
Minimum Split (s)						
Total Split (s)						
Total Split (%)						
Maximum Green (s)						
Yellow Time (s)						
All-Red Time (s)						
Lost Time Adjust (s)						
Total Lost Time (s)						
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						
Queue Length 50th (m)						
Queue Length 95th (m)						
Internal Link Dist (m)	475.5			173.6	179.6	
Turn Bay Length (m)						
Base Capacity (vph)						
Starvation Cap Reductn						
Spillback Cap Reductn						
Storage Cap Reductn						

Lanes, Volumes, Timings
7: South Street & Charles Street South

04/12/2018



Lane Group	SEL	SER	NEL	NET	SWT	SWR
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Reduced v/c Ratio

Intersection Summary

Area Type: Other

Cycle Length: 3

Actuated Cycle Length: 3

Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green

Natural Cycle: 40

Control Type: Pretimed

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0 Intersection LOS: A

Intersection Capacity Utilization 0.0% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 7: South Street & Charles Street South

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Lanes, Volumes, Timings
 1: South Street & Stone Street South

04/12/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	18	4	2	35	5
Future Volume (vph)	0	18	4	2	35	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865		0.955			
Flt Protected						0.958
Satd. Flow (prot)	1469	0	1719	0	0	1724
Flt Permitted						0.958
Satd. Flow (perm)	1469	0	1719	0	0	1724
Link Speed (k/h)	50		50			50
Link Distance (m)	197.6		28.3			47.9
Travel Time (s)	14.2		2.0			3.4
Confl. Peds. (#/hr)		4		8	8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%
Adj. Flow (vph)	0	20	4	2	38	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	6	0	0	43
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

1: South Street & Stone Street South

04/12/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	18	4	2	35	5
Future Volume (Veh/h)	0	18	4	2	35	5
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	20	4	2	38	5
Pedestrians	8				4	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	1				0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	94	17			14	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	94	17			14	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	98			98	
cM capacity (veh/h)	883	1040			1607	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	6	43			
Volume Left	0	0	38			
Volume Right	20	2	0			
cSH	1040	1700	1607			
Volume to Capacity	0.02	0.00	0.02			
Queue Length 95th (m)	0.5	0.0	0.6			
Control Delay (s)	8.5	0.0	6.5			
Lane LOS	A		A			
Approach Delay (s)	8.5	0.0	6.5			
Approach LOS	A					
Intersection Summary						
Average Delay			6.5			
Intersection Capacity Utilization			20.2%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
 2: Water Street/John Street & Stone Street South

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	0	21	0	3	3	14	21	0	0	31	20
Future Volume (vph)	38	0	21	0	3	3	14	21	0	0	31	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865		0.932							0.947
Flt Protected		0.950						0.981				
Satd. Flow (prot)	0	0	1557	0	1342	0	0	1712	0	0	1705	0
Flt Permitted		0.950						0.981				
Satd. Flow (perm)	0	0	1557	0	1342	0	0	1712	0	0	1705	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.4			97.0			38.9			528.8	
Travel Time (s)		4.3			7.0			2.8			38.1	
Confl. Peds. (#/hr)	3		5	5		3	17		7	7		17
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%	0%	50%	8%	0%	0%	0%	0%	0%
Adj. Flow (vph)	41	0	23	0	3	3	15	23	0	0	34	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	23	0	6	0	0	38	0	0	56	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

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

HCM Unsignalized Intersection Capacity Analysis
 2: Water Street/John Street & Stone Street South

04/12/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	0	21	0	3	3	14	21	0	0	31	20
Future Volume (Veh/h)	38	0	21	0	3	3	14	21	0	0	31	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	0	23	0	3	3	15	23	0	0	34	22
Pedestrians		17			7			5			3	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	122	122	67	133	133	33	73			30		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122	122	67	133	133	33	73			30		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.7	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.8	2.3			2.2		
p0 queue free %	95	100	98	100	100	100	99			100		
cM capacity (veh/h)	818	749	984	797	739	911	1468			1587		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	64	6	38	56								
Volume Left	41	0	15	0								
Volume Right	23	3	0	22								
cSH	871	816	1468	1700								
Volume to Capacity	0.07	0.01	0.01	0.03								
Queue Length 95th (m)	1.9	0.2	0.2	0.0								
Control Delay (s)	9.5	9.4	3.0	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.5	9.4	3.0	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			Err%	ICU Level of Service							H	
Analysis Period (min)			15									

Lanes, Volumes, Timings
3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	331	36	29	304	112	26	51	49	106	49	73
Future Volume (vph)	86	331	36	29	304	112	26	51	49	106	49	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.97	0.99		0.97	0.95		0.93	0.96	
Frt		0.985			0.960			0.926			0.910	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1698	0	1644	1652	0	1583	1569	0	1676	1571	0
Flt Permitted	0.366			0.414			0.644			0.687		
Satd. Flow (perm)	642	1698	0	697	1652	0	1039	1569	0	1128	1571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			25			46			71	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		96.1			200.4			528.8			53.5	
Travel Time (s)		6.9			14.4			38.1			3.9	
Confl. Peds. (#/hr)	8		32	32		8	19		39	39		19
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%	4%	0%	4%	5%	0%	8%	2%	0%	2%	0%	1%
Adj. Flow (vph)	93	360	39	32	330	122	28	55	53	115	53	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	93	399	0	32	452	0	28	108	0	115	132	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		13.0			13.0			7.0			7.0	
Flash Dont Walk (s)		14.0			14.0			17.0			17.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.23	0.50		0.07	0.57		0.08	0.26		0.32	0.31	
Control Delay	10.9	20.7		15.2	26.9		23.0	20.4		26.9	17.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.9	20.7		15.2	26.9		23.0	20.4		26.9	17.5	
LOS	B	C		B	C		C	C		C	B	
Approach Delay		18.8			26.1			20.9			21.9	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			C			C				
Queue Length 50th (m)	7.9	53.4		3.2	56.8		3.8	10.1		16.5	9.9	
Queue Length 95th (m)	15.0	80.7		m8.6	90.6		10.1	24.8		30.1	26.1	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	408	801		433	789		338	411		365	431	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.23	0.50		0.07	0.57		0.08	0.26		0.32	0.31	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 22.2 Intersection LOS: C
 Intersection Capacity Utilization 63.8% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings
4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	19	457	32	25	417	63	9	14	19	130	22	33
Future Volume (vph)	19	457	32	25	417	63	9	14	19	130	22	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.96	1.00			0.96				0.95
Frt		0.991			0.980			0.938				0.976
Flt Protected		0.998		0.950				0.989				0.966
Satd. Flow (prot)	0	1716	0	1710	1708	0	0	1541	0	0	1642	0
Flt Permitted		0.974		0.436				0.930				0.762
Satd. Flow (perm)	0	1674	0	750	1708	0	0	1425	0	0	1261	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			16			21				10
Link Speed (k/h)		50			50			50				50
Link Distance (m)		200.4			204.6			117.4				55.1
Travel Time (s)		14.4			14.7			8.5				4.0
Confl. Peds. (#/hr)	6		60	60		6	61		19	19		61
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%	3%	0%	0%	3%	2%	13%	8%	0%	1%	0%	0%
Adj. Flow (vph)	21	497	35	27	453	68	10	15	21	141	24	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	553	0	27	521	0	0	46	0	0	201	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	11.0	11.0		11.0	11.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio		0.66		0.66	0.66			0.24			0.24	
v/c Ratio		0.50		0.05	0.46			0.13			0.65	
Control Delay		7.5		2.0	5.5			20.1			43.5	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		7.5		2.0	5.5			20.1			43.5	
LOS		A		A	A			C			D	
Approach Delay		7.5			5.3			20.1			43.5	

Lanes, Volumes, Timings
 4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			C			D	
Queue Length 50th (m)		65.9		0.5	46.0			4.0			35.2	
Queue Length 95th (m)		91.2		m1.0	56.3			13.4			60.9	
Internal Link Dist (m)		176.4			180.6			93.4			31.1	
Turn Bay Length (m)				60.0								
Base Capacity (vph)		1107		495	1132			357			310	
Starvation Cap Reductn		0		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.50		0.05	0.46			0.13			0.65	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 42 (42%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 12.4
 Intersection LOS: B
 Intersection Capacity Utilization 72.4%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Charles Street South & King Street



Lanes, Volumes, Timings
5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	605	16	34	511	36	19	31	76	61	22	12
Future Volume (vph)	11	605	16	34	511	36	19	31	76	61	22	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	1.00			0.94			0.96	
Fr _t		0.996			0.990			0.919			0.983	
Fl _t Protected	0.950			0.950				0.992			0.969	
Satd. Flow (prot)	1710	1739	0	1710	1744	0	0	1528	0	0	1705	0
Fl _t Permitted	0.362			0.313				0.950			0.744	
Satd. Flow (perm)	645	1739	0	556	1744	0	0	1459	0	0	1263	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			7			71			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		204.6			68.0			118.0			53.5	
Travel Time (s)		14.7			4.9			8.5			3.9	
Confl. Peds. (#/hr)	18		25	25		18	11		33	33		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%	0%	0%	2%	0%	0%	3%	1%	0%	0%	0%
Adj. Flow (vph)	12	658	17	37	555	39	21	34	83	66	24	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	675	0	37	594	0	0	138	0	0	103	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	16.0	16.0		16.0	16.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	66.0	66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
v/c Ratio	0.03	0.59		0.10	0.52			0.34			0.33	
Control Delay	4.2	7.7		7.1	10.6			18.6			32.9	
Queue Delay	0.0	0.1		0.0	0.0			0.0			0.0	
Total Delay	4.2	7.8		7.1	10.6			18.6			32.9	
LOS	A	A		A	B			B			C	
Approach Delay		7.7			10.4			18.6			32.9	

Lanes, Volumes, Timings
 5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	A			B			B			C		
Queue Length 50th (m)	0.6	39.5		2.5	55.3			10.9			16.2	
Queue Length 95th (m)	m1.1	49.9		6.4	81.5			28.0			31.9	
Internal Link Dist (m)		180.6			44.0			94.0			29.5	
Turn Bay Length (m)	85.0			25.0								
Base Capacity (vph)	425	1148		366	1153			404			308	
Starvation Cap Reductn	0	48		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.61		0.10	0.52			0.34			0.33	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 11.4
 Intersection LOS: B
 Intersection Capacity Utilization 61.4%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: William Street South & King Street



Lanes, Volumes, Timings
7: South Street & Charles Street South

04/12/2018



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	0	0	0
Right Turn on Red	Yes	Yes	Yes			Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	499.5			197.6	204.0	
Travel Time (s)	36.0			14.2	14.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Turn Type						
Protected Phases						
Permitted Phases						
Minimum Split (s)						
Total Split (s)						
Total Split (%)						
Maximum Green (s)						
Yellow Time (s)						
All-Red Time (s)						
Lost Time Adjust (s)						
Total Lost Time (s)						
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						
Queue Length 50th (m)						
Queue Length 95th (m)						
Internal Link Dist (m)	475.5			173.6	180.0	
Turn Bay Length (m)						
Base Capacity (vph)						
Starvation Cap Reductn						
Spillback Cap Reductn						
Storage Cap Reductn						

Lanes, Volumes, Timings

3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	227	30	20	261	77	17	108	21	65	92	72
Future Volume (vph)	67	227	30	20	261	77	17	108	21	65	92	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.97	0.99		0.98	0.98	
Frt		0.982			0.966			0.975			0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	1672	0	1710	1632	0	1613	1659	0	1676	1532	0
Flt Permitted	0.443			0.528			0.555			0.628		
Satd. Flow (perm)	750	1672	0	944	1632	0	918	1659	0	1086	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			20			9				37
Link Speed (k/h)		50			50			50				50
Link Distance (m)		96.1			200.4			528.8				53.5
Travel Time (s)		6.9			14.4			38.1				3.9
Confl. Peds. (#/hr)	9		4	4		9	12		8	8		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 (%)	5%	6%	0%	0%	7%	0%	6%	6%	0%	2%	7%	7%
Adj. Flow (vph)	73	247	33	22	284	84	18	117	23	71	100	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	280	0	22	368	0	18	140	0	71	178	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.16	0.35		0.04	0.47		0.06	0.35		0.20	0.45	
Control Delay	10.2	17.9		15.8	33.2		22.7	32.3		24.7	29.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.2	17.9		15.8	33.2		22.7	32.3		24.7	29.7	
LOS	B	B		B	C		C	C		C	C	
Approach Delay		16.3			32.2			31.2			28.2	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			C			C			C		
Queue Length 50th (m)	6.1	33.9		3.1	0.0		2.4	22.1		9.9	24.3	
Queue Length 95th (m)	12.4	53.7		m7.4	102.9		7.4	40.0		20.2	45.4	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	457	790		555	777		310	405		355	395	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.16	0.35		0.04	0.47		0.06	0.35		0.20	0.45	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 87 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 26.3
 Intersection LOS: C
 Intersection Capacity Utilization 65.8%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings
3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	408	36	29	376	112	26	128	49	106	123	73
Future Volume (vph)	86	408	36	29	376	112	26	128	49	106	123	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.98	0.99		0.97	0.97		0.94	0.98	
Frt		0.988			0.966			0.959			0.944	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1705	0	1644	1661	0	1583	1655	0	1676	1656	0
Flt Permitted	0.296			0.339			0.489			0.529		
Satd. Flow (perm)	519	1705	0	574	1661	0	789	1655	0	880	1656	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			20			18				28
Link Speed (k/h)		50			50			50				50
Link Distance (m)		96.1			200.4			528.8				53.5
Travel Time (s)		6.9			14.4			38.1				3.9
Confl. Peds. (#/hr)	8		32	32		8	19		39	39		19
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%	4%	0%	4%	5%	0%	8%	2%	0%	2%	0%	1%
Adj. Flow (vph)	93	443	39	32	409	122	28	139	53	115	134	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	93	482	0	32	531	0	28	192	0	115	213	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		13.0			13.0			7.0			7.0	
Flash Dont Walk (s)		14.0			14.0			17.0			17.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.27	0.60		0.09	0.67		0.10	0.47		0.38	0.51	
Control Delay	11.5	23.2		16.7	32.9		23.3	33.8		28.4	33.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.5	23.2		16.7	32.9		23.3	33.8		28.4	33.4	
LOS	B	C		B	C		C	C		C	C	
Approach Delay		21.3			32.0			32.4			31.6	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C				C				C		
Queue Length 50th (m)	7.9	69.3		3.7	77.8		3.8	30.4		16.5	32.6	
Queue Length 95th (m)	15.0	102.9		m7.7	113.3		10.1	52.4		30.1	56.1	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	349	804		374	791		276	410		303	418	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.27	0.60		0.09	0.67		0.10	0.47		0.38	0.51	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 28.3
 Intersection LOS: C
 Intersection Capacity Utilization 74.5%
 ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



APPENDIX

D FUTURE BACKGROUND INTERSECTION CAPACITY ANALYSIS

Lanes, Volumes, Timings
 1: South Street & Stone Street South

04/12/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	17	0	0	15	0
Future Volume (vph)	0	17	0	0	15	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1557	0	1800	0	0	1710
Flt Permitted						0.950
Satd. Flow (perm)	1557	0	1800	0	0	1710
Link Speed (k/h)	50		50		50	
Link Distance (m)	197.6		28.3		86.9	
Travel Time (s)	14.2		2.0		6.3	
Confl. Peds. (#/hr)	1	10				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	18	0	0	16	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	0	0	16
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

1: South Street & Stone Street South

04/12/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	17	0	0	15	0
Future Volume (Veh/h)	0	17	0	0	15	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	18	0	0	16	0
Pedestrians			1			10
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	33	10			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	10			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	975	1068			1636	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	0	16			
Volume Left	0	0	16			
Volume Right	18	0	0			
cSH	1068	1700	1636			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (m)	0.4	0.0	0.2			
Control Delay (s)	8.4	0.0	7.2			
Lane LOS	A		A			
Approach Delay (s)	8.4	0.0	7.2			
Approach LOS	A					
Intersection Summary						
Average Delay			7.9			
Intersection Capacity Utilization			16.2%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
 2: Stone Street South & Water Street/John Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	0	12	4	5	7	12	17	0	0	13	26
Future Volume (vph)	26	0	12	4	5	7	12	17	0	0	13	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865		0.936							0.910
Flt Protected		0.950			0.988			0.979				
Satd. Flow (prot)	0	0	1557	0	1374	0	0	1762	0	0	1595	0
Flt Permitted		0.950			0.988			0.979				
Satd. Flow (perm)	0	0	1557	0	1374	0	0	1762	0	0	1595	0
Link Speed (k/h)		50			50			50				50
Link Distance (m)		59.4			97.0			86.9				528.8
Travel Time (s)		4.3			7.0			6.3				38.1
Confl. Peds. (#/hr)	4		6	6		4	10		5	5		10
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%	0%	50%	0%	20%	0%	0%	0%	0%	0%	4%
Adj. Flow (vph)	28	0	13	4	5	8	13	18	0	0	14	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	13	0	17	0	0	31	0	0	42	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

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

HCM Unsignalized Intersection Capacity Analysis

2: Stone Street South & Water Street/John Street

04/12/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	12	4	5	7	12	17	0	0	13	26
Future Volume (Veh/h)	26	0	12	4	5	7	12	17	0	0	13	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	0	13	4	5	8	13	18	0	0	14	28
Pedestrians		10			5			6			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	96	87	44	96	101	27	52			23		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96	87	44	96	101	27	52			23		
tC, single (s)	7.1	6.5	6.2	7.6	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.0	4.0	3.5	2.2			2.2		
p0 queue free %	97	100	99	99	99	99	99			100		
cM capacity (veh/h)	846	790	1018	755	776	991	1554			1599		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	41	17	31	42								
Volume Left	28	4	13	0								
Volume Right	13	8	0	28								
cSH	894	858	1554	1700								
Volume to Capacity	0.05	0.02	0.01	0.02								
Queue Length 95th (m)	1.2	0.5	0.2	0.0								
Control Delay (s)	9.2	9.3	3.1	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.2	9.3	3.1	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			Err%	ICU Level of Service							H	
Analysis Period (min)			15									

Lanes, Volumes, Timings 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	190	32	21	220	80	18	57	22	68	48	75
Future Volume (vph)	70	190	32	21	220	80	18	57	22	68	48	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.97	0.99		0.98	0.97	
Frt		0.978			0.960			0.958			0.908	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	1667	0	1710	1623	0	1613	1632	0	1676	1474	0
Flt Permitted	0.483			0.567			0.640			0.701		
Satd. Flow (perm)	816	1667	0	1012	1623	0	1054	1632	0	1210	1474	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			25			18			75	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		96.1			200.4			528.8			53.5	
Travel Time (s)		6.9			14.4			38.1			3.9	
Confl. Peds. (#/hr)	9		4	4		9	12		8	8		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 (%)	5%	6%	0%	0%	7%	0%	6%	6%	0%	2%	7%	7%
Adj. Flow (vph)	76	207	35	23	239	87	20	62	24	74	52	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	242	0	23	326	0	20	86	0	74	134	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.16	0.31		0.04	0.42		0.06	0.21		0.19	0.33	
Control Delay	10.2	16.9		16.1	31.0		22.7	25.8		24.6	17.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.2	16.9		16.1	31.0		22.7	25.8		24.6	17.3	
LOS	B	B		B	C		C	C		C	B	
Approach Delay		15.3			30.0			25.2			19.9	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			C			C			B		
Queue Length 50th (m)	6.4	28.0		3.1	0.0		2.7	11.0		10.3	9.6	
Queue Length 95th (m)	12.8	45.7		m8.4	87.6		8.0	24.3		20.9	26.0	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	489	789		588	776		344	405		386	410	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.16	0.31		0.04	0.42		0.06	0.21		0.19	0.33	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 87 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 22.6
 Intersection LOS: C
 Intersection Capacity Utilization 58.3%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings
4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	9	294	12	13	309	88	12	31	19	77	22	21
Future Volume (vph)	9	294	12	13	309	88	12	31	19	77	22	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.99			0.99			0.99	
Frt		0.995			0.967			0.958			0.976	
Flt Protected		0.999		0.950				0.991			0.969	
Satd. Flow (prot)	0	1739	0	1569	1662	0	0	1662	0	0	1660	0
Flt Permitted		0.987		0.554				0.943			0.793	
Satd. Flow (perm)	0	1717	0	911	1662	0	0	1577	0	0	1351	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			30			21			10	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.4			204.6			117.4			55.1	
Travel Time (s)		14.4			14.7			8.5			4.0	
Confl. Peds. (#/hr)	11		4	4		11	9		5	5		9
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%	0%	9%	4%	3%	0%	0%	6%	0%	10%	0%
Adj. Flow (vph)	10	320	13	14	336	96	13	34	21	84	24	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	343	0	14	432	0	0	68	0	0	131	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	11.0	11.0		11.0	11.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio		0.66		0.66	0.66			0.24			0.24	
v/c Ratio		0.30		0.02	0.39			0.17			0.40	
Control Delay		9.6		4.6	5.3			23.4			33.6	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		9.6		4.6	5.3			23.4			33.6	
LOS		A		A	A			C			C	
Approach Delay		9.6			5.3			23.4			33.6	

Lanes, Volumes, Timings
 4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A				A				C		
Queue Length 50th (m)		37.5		0.6	16.5			7.6				20.7
Queue Length 95th (m)		55.3		m1.6	23.5			19.0				38.9
Internal Link Dist (m)		176.4			180.6			93.4				31.1
Turn Bay Length (m)				60.0								
Base Capacity (vph)		1134		601	1107			394				331
Starvation Cap Reductn		0		0	0			0				0
Spillback Cap Reductn		0		0	0			0				0
Storage Cap Reductn		0		0	0			0				0
Reduced v/c Ratio		0.30		0.02	0.39			0.17				0.40

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 11.8
 Intersection LOS: B
 Intersection Capacity Utilization 53.1%
 ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Charles Street South & King Street



Lanes, Volumes, Timings
5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	381	20	43	402	24	25	21	34	44	20	10
Future Volume (vph)	7	381	20	43	402	24	25	21	34	44	20	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			0.96			0.97	
Fr _t		0.992			0.992			0.943			0.982	
Fl _t Protected	0.950			0.950				0.985			0.971	
Satd. Flow (prot)	1425	1745	0	1583	1733	0	0	1550	0	0	1683	0
Fl _t Permitted	0.446			0.464				0.903			0.803	
Satd. Flow (perm)	664	1745	0	770	1733	0	0	1420	0	0	1348	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			6			35			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		204.6			68.0			118.0			53.5	
Travel Time (s)		14.7			4.9			8.5			3.9	
Confl. Peds. (#/hr)	10		5	5		10	2		28	28		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	20%	2%	6%	8%	3%	0%	9%	0%	3%	0%	6%	0%
Adj. Flow (vph)	8	414	22	47	437	26	27	23	37	48	22	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	436	0	47	463	0	0	87	0	0	81	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	16.0	16.0		16.0	16.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	66.0	66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
v/c Ratio	0.02	0.38		0.09	0.40			0.24			0.25	
Control Delay	3.3	5.2		6.7	9.0			21.4			30.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.3	5.2		6.7	9.0			21.4			30.4	
LOS	A	A		A	A			C			C	
Approach Delay		5.2			8.8			21.4			30.4	

Lanes, Volumes, Timings
 5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	A			A			C			C		
Queue Length 50th (m)	0.4	24.9		3.1	38.7			8.4			12.2	
Queue Length 95th (m)	m1.1	34.7		7.5	57.6			21.6			25.5	
Internal Link Dist (m)	180.6			44.0			94.0			29.5		
Turn Bay Length (m)	85.0			25.0								
Base Capacity (vph)	438	1153		508	1145			367			328	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.38		0.09	0.40			0.24			0.25	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 9.9
 Intersection LOS: A
 Intersection Capacity Utilization 64.4%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: William Street South & King Street



Lanes, Volumes, Timings
7: South Street & Charles Street South

04/12/2018



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	0	0	0
Right Turn on Red	Yes	Yes	Yes			Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	499.5			197.6	203.6	
Travel Time (s)	36.0			14.2	14.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Turn Type						
Protected Phases						
Permitted Phases						
Minimum Split (s)						
Total Split (s)						
Total Split (%)						
Maximum Green (s)						
Yellow Time (s)						
All-Red Time (s)						
Lost Time Adjust (s)						
Total Lost Time (s)						
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						
Queue Length 50th (m)						
Queue Length 95th (m)						
Internal Link Dist (m)	475.5			173.6	179.6	
Turn Bay Length (m)						
Base Capacity (vph)						
Starvation Cap Reductn						
Spillback Cap Reductn						
Storage Cap Reductn						

Lanes, Volumes, Timings
1: South Street

04/12/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	19	5	3	37	6
Future Volume (vph)	0	19	5	3	37	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865		0.949			
Flt Protected						0.959
Satd. Flow (prot)	1469	0	1708	0	0	1726
Flt Permitted						0.959
Satd. Flow (perm)	1469	0	1708	0	0	1726
Link Speed (k/h)	50		50			50
Link Distance (m)	197.6		28.3			47.9
Travel Time (s)	14.2		2.0			3.4
Confl. Peds. (#/hr)		4		8	8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%
Adj. Flow (vph)	0	21	5	3	40	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	8	0	0	47
Sign Control	Stop		Free			Free

Intersection Summary

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

HCM Unsignalized Intersection Capacity Analysis

1: South Street

04/12/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	19	5	3	37	6
Future Volume (Veh/h)	0	19	5	3	37	6
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	21	5	3	40	7
Pedestrians	8					4
Lane Width (m)	3.6					3.6
Walking Speed (m/s)	1.2					1.2
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	102	18			16	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	102	18			16	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	98			98	
cM capacity (veh/h)	873	1038			1604	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	21	8	47			
Volume Left	0	0	40			
Volume Right	21	3	0			
cSH	1038	1700	1604			
Volume to Capacity	0.02	0.00	0.02			
Queue Length 95th (m)	0.5	0.0	0.6			
Control Delay (s)	8.5	0.0	6.2			
Lane LOS	A		A			
Approach Delay (s)	8.5	0.0	6.2			
Approach LOS	A					
Intersection Summary						
Average Delay			6.2			
Intersection Capacity Utilization			20.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
 2: Water Street/John Street & Stone Street South

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	0	22	0	4	4	15	22	0	0	33	21
Future Volume (vph)	40	0	22	0	4	4	15	22	0	0	33	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865		0.932							0.947
Flt Protected		0.950						0.980				
Satd. Flow (prot)	0	0	1557	0	1342	0	0	1709	0	0	1705	0
Flt Permitted		0.950						0.980				
Satd. Flow (perm)	0	0	1557	0	1342	0	0	1709	0	0	1705	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.4			97.0			38.9			528.8	
Travel Time (s)		4.3			7.0			2.8			38.1	
Confl. Peds. (#/hr)	3		5	5		3	17		7	7		17
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%	0%	50%	8%	0%	0%	0%	0%	0%
Adj. Flow (vph)	43	0	24	0	4	4	16	24	0	0	36	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	24	0	8	0	0	40	0	0	59	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

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

HCM Unsignalized Intersection Capacity Analysis
 2: Water Street/John Street & Stone Street South

04/12/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	22	0	4	4	15	22	0	0	33	21
Future Volume (Veh/h)	40	0	22	0	4	4	15	22	0	0	33	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	0	24	0	4	4	16	24	0	0	36	23
Pedestrians		17			7			5			3	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	130	128	70	140	139	34	76			31		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	130	128	70	140	139	34	76			31		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.7	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.8	2.3			2.2		
p0 queue free %	95	100	98	100	99	100	99			100		
cM capacity (veh/h)	807	743	981	788	733	910	1465			1585		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	67	8	40	59								
Volume Left	43	0	16	0								
Volume Right	24	4	0	23								
cSH	862	812	1465	1700								
Volume to Capacity	0.08	0.01	0.01	0.03								
Queue Length 95th (m)	2.0	0.2	0.3	0.0								
Control Delay (s)	9.5	9.5	3.0	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.5	9.5	3.0	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			Err%	ICU Level of Service							H	
Analysis Period (min)			15									

Lanes, Volumes, Timings 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	344	38	31	316	117	27	53	51	111	51	76
Future Volume (vph)	90	344	38	31	316	117	27	53	51	111	51	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.97	0.99		0.97	0.95		0.93	0.96	
Frt		0.985			0.959			0.927			0.910	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1698	0	1644	1650	0	1583	1572	0	1676	1571	0
Flt Permitted	0.349			0.399			0.632			0.682		
Satd. Flow (perm)	612	1698	0	672	1650	0	1020	1572	0	1120	1571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			25			45			71	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		96.1			200.4			528.8			53.5	
Travel Time (s)		6.9			14.4			38.1			3.9	
Confl. Peds. (#/hr)	8		32	32		8	19		39	39		19
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%	4%	0%	4%	5%	0%	8%	2%	0%	2%	0%	1%
Adj. Flow (vph)	98	374	41	34	343	127	29	58	55	121	55	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	415	0	34	470	0	29	113	0	121	138	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		13.0			13.0			7.0			7.0	
Flash Dont Walk (s)		14.0			14.0			17.0			17.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.25	0.52		0.08	0.60		0.09	0.27		0.33	0.32	
Control Delay	11.1	21.1		15.5	28.0		23.1	21.1		27.4	18.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.1	21.1		15.5	28.0		23.1	21.1		27.4	18.2	
LOS	B	C		B	C		C	C		C	B	
Approach Delay		19.2			27.1			21.5			22.5	

Lanes, Volumes, Timings

3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			C			C			C		
Queue Length 50th (m)	8.3	56.3		3.5	60.5		4.0	11.1		17.4	10.9	
Queue Length 95th (m)	15.7	84.7		m8.9	95.3		10.4	26.2		31.5	27.7	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	394	801		421	788		334	411		363	431	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.25	0.52		0.08	0.60		0.09	0.27		0.33	0.32	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 22.9
 Intersection LOS: C
 Intersection Capacity Utilization 65.9%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings
4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	20	475	34	26	433	66	10	15	20	135	23	35
Future Volume (vph)	20	475	34	26	433	66	10	15	20	135	23	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.96	1.00			0.96				0.95
Frt		0.991			0.980			0.939				0.976
Flt Protected		0.998		0.950				0.989				0.966
Satd. Flow (prot)	0	1715	0	1710	1708	0	0	1542	0	0	1641	0
Flt Permitted		0.972		0.426				0.925				0.761
Satd. Flow (perm)	0	1670	0	734	1708	0	0	1418	0	0	1259	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			16			22				10
Link Speed (k/h)		50			50			50				50
Link Distance (m)		200.4			204.6			117.4				55.1
Travel Time (s)		14.4			14.7			8.5				4.0
Confl. Peds. (#/hr)	6		60	60		6	61		19	19		61
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%	3%	0%	0%	3%	2%	13%	8%	0%	1%	0%	0%
Adj. Flow (vph)	22	516	37	28	471	72	11	16	22	147	25	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	575	0	28	543	0	0	49	0	0	210	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	11.0	11.0		11.0	11.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio		0.66		0.66	0.66			0.24			0.24	
v/c Ratio		0.52		0.06	0.48			0.14			0.68	
Control Delay		7.7		2.0	5.7			20.3			45.4	
Queue Delay		0.3		0.0	0.0			0.0			0.0	
Total Delay		8.0		2.0	5.7			20.3			45.4	
LOS		A		A	A			C			D	
Approach Delay		8.0			5.5			20.3			45.4	

Lanes, Volumes, Timings
 4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			C			D	
Queue Length 50th (m)		69.1		0.5	50.0			4.3			37.2	
Queue Length 95th (m)		95.5		m1.0	59.2			13.9			#68.0	
Internal Link Dist (m)		176.4			180.6			93.4			31.1	
Turn Bay Length (m)				60.0								
Base Capacity (vph)		1104		484	1132			357			309	
Starvation Cap Reductn		147		0	0			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.60		0.06	0.48			0.14			0.68	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 42 (42%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 13.0
 Intersection LOS: B
 Intersection Capacity Utilization 74.4%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Charles Street South & King Street



Lanes, Volumes, Timings
5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	629	17	36	531	38	20	33	79	64	23	13
Future Volume (vph)	12	629	17	36	531	38	20	33	79	64	23	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	1.00			0.94			0.96	
Fr _t		0.996			0.990			0.919			0.983	
Fl _t Protected	0.950			0.950				0.992			0.969	
Satd. Flow (prot)	1710	1739	0	1710	1743	0	0	1529	0	0	1705	0
Fl _t Permitted	0.347			0.297				0.948			0.724	
Satd. Flow (perm)	618	1739	0	528	1743	0	0	1457	0	0	1230	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			8			70			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		204.6			68.0			118.0			53.5	
Travel Time (s)		14.7			4.9			8.5			3.9	
Confl. Peds. (#/hr)	18		25	25		18	11		33	33		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%	0%	0%	2%	0%	0%	3%	1%	0%	0%	0%
Adj. Flow (vph)	13	684	18	39	577	41	22	36	86	70	25	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	702	0	39	618	0	0	144	0	0	109	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	16.0	16.0		16.0	16.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	66.0	66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
v/c Ratio	0.03	0.61		0.11	0.54			0.36			0.36	
Control Delay	4.4	8.1		7.2	10.9			19.5			33.7	
Queue Delay	0.0	0.1		0.0	0.0			0.0			0.0	
Total Delay	4.4	8.2		7.2	10.9			19.5			33.7	
LOS	A	A		A	B			B			C	
Approach Delay		8.1			10.7			19.5			33.7	

Lanes, Volumes, Timings
 5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	A			B			B			C		
Queue Length 50th (m)	0.7	41.3		2.6	58.7			12.1			17.3	
Queue Length 95th (m)	m1.2	54.6		6.8	86.2			29.7			33.8	
Internal Link Dist (m)		180.6			44.0			94.0			29.5	
Turn Bay Length (m)	85.0			25.0								
Base Capacity (vph)	407	1148		348	1153			402			300	
Starvation Cap Reductn	0	48		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.64		0.11	0.54			0.36			0.36	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 11.9
 Intersection LOS: B
 Intersection Capacity Utilization 62.8%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: William Street South & King Street



Lanes, Volumes, Timings
7: South Street & Charles Street South

04/12/2018



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	0	0	0
Right Turn on Red	Yes	Yes	Yes			Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	499.5			197.6	204.0	
Travel Time (s)	36.0			14.2	14.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Turn Type						
Protected Phases						
Permitted Phases						
Minimum Split (s)						
Total Split (s)						
Total Split (%)						
Maximum Green (s)						
Yellow Time (s)						
All-Red Time (s)						
Lost Time Adjust (s)						
Total Lost Time (s)						
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						
Queue Length 50th (m)						
Queue Length 95th (m)						
Internal Link Dist (m)	475.5			173.6	180.0	
Turn Bay Length (m)						
Base Capacity (vph)						
Starvation Cap Reductn						
Spillback Cap Reductn						
Storage Cap Reductn						

Lanes, Volumes, Timings 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	236	32	21	271	80	18	113	22	68	96	75
Future Volume (vph)	70	236	32	21	271	80	18	113	22	68	96	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.97	0.99		0.98	0.97	
Frt		0.982			0.966			0.976			0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	1672	0	1710	1632	0	1613	1661	0	1676	1532	0
Flt Permitted	0.430			0.516			0.540			0.615		
Satd. Flow (perm)	727	1672	0	922	1632	0	889	1661	0	1064	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			20			9				37
Link Speed (k/h)		50			50			50				50
Link Distance (m)		96.1			200.4			528.8				53.5
Travel Time (s)		6.9			14.4			38.1				3.9
Confl. Peds. (#/hr)	9		4	4		9	12		8	8		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 (%)	5%	6%	0%	0%	7%	0%	6%	6%	0%	2%	7%	7%
Adj. Flow (vph)	76	257	35	23	295	87	20	123	24	74	104	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	292	0	23	382	0	20	147	0	74	186	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.17	0.37		0.04	0.49		0.07	0.36		0.21	0.47	
Control Delay	10.3	18.1		15.6	33.6		22.8	32.7		24.9	30.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.3	18.1		15.6	33.6		22.8	32.7		24.9	30.4	
LOS	B	B		B	C		C	C		C	C	
Approach Delay		16.5			32.5			31.5			28.8	

Lanes, Volumes, Timings

3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			C			C			C		
Queue Length 50th (m)	6.4	35.7		3.2	0.0		2.7	23.4		10.3	25.9	
Queue Length 95th (m)	12.8	56.4		m7.2	107.2		8.0	41.9		20.9	47.7	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	446	790		545	777		302	405		349	395	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.17	0.37		0.04	0.49		0.07	0.36		0.21	0.47	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 87 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 26.7
 Intersection LOS: C
 Intersection Capacity Utilization 65.8%
 ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings
3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	424	38	31	391	117	27	133	51	111	128	76
Future Volume (vph)	90	424	38	31	391	117	27	133	51	111	128	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	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		0.98	0.99		0.97	0.97		0.94	0.98	
Frt		0.988			0.965			0.959			0.944	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1704	0	1644	1659	0	1583	1655	0	1676	1656	0
Flt Permitted	0.278			0.321			0.473			0.514		
Satd. Flow (perm)	488	1704	0	544	1659	0	768	1655	0	856	1656	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			20			18			28	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		96.1			200.4			528.8			53.5	
Travel Time (s)		6.9			14.4			38.1			3.9	
Confl. Peds. (#/hr)	8		32	32		8	19		39	39		19
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%	4%	0%	4%	5%	0%	8%	2%	0%	2%	0%	1%
Adj. Flow (vph)	98	461	41	34	425	127	29	145	55	121	139	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	502	0	34	552	0	29	200	0	121	222	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		13.0			13.0			7.0			7.0	
Flash Dont Walk (s)		14.0			14.0			17.0			17.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.29	0.62		0.09	0.70		0.11	0.49		0.41	0.53	
Control Delay	11.9	23.9		16.8	34.2		23.4	34.4		29.2	34.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.9	23.9		16.8	34.2		23.4	34.4		29.2	34.1	
LOS	B	C		B	C		C	C		C	C	
Approach Delay		21.9			33.2			33.0			32.4	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C				C				C		
Queue Length 50th (m)	8.3	73.3		4.0	82.7		4.0	32.0		17.4	34.4	
Queue Length 95th (m)	15.7	108.9		m8.0	119.3		10.4	54.7		31.5	58.7	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	334	804		359	790		271	410		297	418	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.29	0.62		0.09	0.70		0.11	0.49		0.41	0.53	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 29.2
 Intersection LOS: C
 Intersection Capacity Utilization 76.2%
 ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



APPENDIX

E TOTAL FUTURE INTERSECTION CAPACITY ANALYSIS

Lanes, Volumes, Timings

1: South Street

04/12/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	47	0	0	21	0
Future Volume (vph)	0	47	0	0	21	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1557	0	1800	0	0	1710
Flt Permitted						0.950
Satd. Flow (perm)	1557	0	1800	0	0	1710
Link Speed (k/h)	50		50		50	
Link Distance (m)	197.6		28.3		86.9	
Travel Time (s)	14.2		2.0		6.3	
Confl. Peds. (#/hr)	1	10				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	51	0	0	23	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	51	0	0	0	0	23
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25	15	15		25	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 16.7% ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

1: South Street

04/12/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	47	0	0	21	0
Future Volume (Veh/h)	0	47	0	0	21	0
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	51	0	0	23	0
Pedestrians			1			10
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	47	10			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	47	10			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			99	
cM capacity (veh/h)	954	1068			1636	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	51	0	23			
Volume Left	0	0	23			
Volume Right	51	0	0			
cSH	1068	1700	1636			
Volume to Capacity	0.05	0.00	0.01			
Queue Length 95th (m)	1.2	0.0	0.3			
Control Delay (s)	8.5	0.0	7.2			
Lane LOS	A		A			
Approach Delay (s)	8.5	0.0	7.2			
Approach LOS	A					
Intersection Summary						
Average Delay			8.1			
Intersection Capacity Utilization			16.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

2: Water Street/John Street & Stone Street South

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	0	12	4	5	7	13	46	0	0	19	26
Future Volume (vph)	26	0	12	4	5	7	13	46	0	0	19	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865		0.936							0.923
Flt Protected		0.950			0.988			0.989				
Satd. Flow (prot)	0	0	1557	0	1374	0	0	1780	0	0	1624	0
Flt Permitted		0.950			0.988			0.989				
Satd. Flow (perm)	0	0	1557	0	1374	0	0	1780	0	0	1624	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.4			97.0			86.9			528.8	
Travel Time (s)		4.3			7.0			6.3			38.1	
Confl. Peds. (#/hr)	4		6	6		4	10		5	5		10
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%	0%	50%	0%	20%	0%	0%	0%	0%	0%	4%
Adj. Flow (vph)	28	0	13	4	5	8	14	50	0	0	21	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	13	0	17	0	0	64	0	0	49	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			3.6			3.6	
Link Offset(m)		0.0			6.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization Err% ICU Level of Service H

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

2: Water Street/John Street & Stone Street South

04/12/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	12	4	5	7	13	46	0	0	19	26
Future Volume (Veh/h)	26	0	12	4	5	7	13	46	0	0	19	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	0	13	4	5	8	14	50	0	0	21	28
Pedestrians		10			5			6			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	138	128	51	137	142	59	59			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	138	128	51	137	142	59	59			55		
tC, single (s)	7.1	6.5	6.2	7.6	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.0	4.0	3.5	2.2			2.2		
p0 queue free %	96	100	99	99	99	99	99			100		
cM capacity (veh/h)	795	750	1009	707	737	951	1545			1556		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	41	17	64	49								
Volume Left	28	4	14	0								
Volume Right	13	8	0	28								
cSH	852	815	1545	1700								
Volume to Capacity	0.05	0.02	0.01	0.03								
Queue Length 95th (m)	1.2	0.5	0.2	0.0								
Control Delay (s)	9.4	9.5	1.7	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.4	9.5	1.7	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			Err%	ICU Level of Service							H	
Analysis Period (min)			15									

Lanes, Volumes, Timings 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	190	34	24	220	80	25	62	39	68	49	75
Future Volume (vph)	70	190	34	24	220	80	25	62	39	68	49	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.97	0.98		0.98	0.97	
Fr _t		0.977			0.960			0.942			0.909	
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	1665	0	1710	1623	0	1613	1607	0	1676	1476	0
Fl _t Permitted	0.483			0.565			0.638			0.687		
Satd. Flow (perm)	816	1665	0	1009	1623	0	1051	1607	0	1186	1476	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			25			30			73	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		96.1			200.4			528.8			53.5	
Travel Time (s)		6.9			14.4			38.1			3.9	
Confl. Peds. (#/hr)	9		4	4		9	12		8	8		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 (%)	5%	6%	0%	0%	7%	0%	6%	6%	0%	2%	7%	7%
Adj. Flow (vph)	76	207	37	26	239	87	27	67	42	74	53	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	244	0	26	326	0	27	109	0	74	135	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)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018

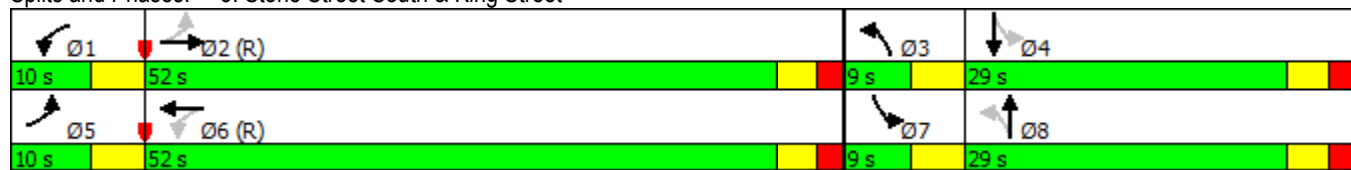


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effect Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.16	0.31		0.04	0.42		0.08	0.27		0.19	0.33	
Control Delay	10.2	16.9		16.0	30.9		23.0	24.3		24.6	17.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.2	16.9		16.0	30.9		23.0	24.3		24.6	17.8	
LOS	B	B		B	C		C	C		C	B	
Approach Delay		15.3			29.8			24.0			20.2	
Approach LOS		B			C			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	87 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	100
Control Type:	Pretimed
Maximum v/c Ratio:	0.42
Intersection Signal Delay:	22.5
Intersection LOS:	C
Intersection Capacity Utilization	60.3%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings
4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	12	307	13	13	311	88	12	31	19	77	22	22
Future Volume (vph)	12	307	13	13	311	88	12	31	19	77	22	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.99			0.99			0.99	
Frt		0.995			0.967			0.958			0.975	
Flt Protected		0.998		0.950				0.991			0.969	
Satd. Flow (prot)	0	1737	0	1569	1662	0	0	1662	0	0	1659	0
Flt Permitted		0.982		0.543				0.943			0.794	
Satd. Flow (perm)	0	1709	0	893	1662	0	0	1577	0	0	1351	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			30			21			11	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.4			204.6			117.4			55.1	
Travel Time (s)		14.4			14.7			8.5			4.0	
Confl. Peds. (#/hr)	11		4	4		11	9		5	5		9
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%	0%	9%	4%	3%	0%	0%	6%	0%	10%	0%
Adj. Flow (vph)	13	334	14	14	338	96	13	34	21	84	24	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	361	0	14	434	0	0	68	0	0	132	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)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	11.0	11.0		11.0	11.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lanes, Volumes, Timings
 4: Charles Street South & King Street

04/12/2018

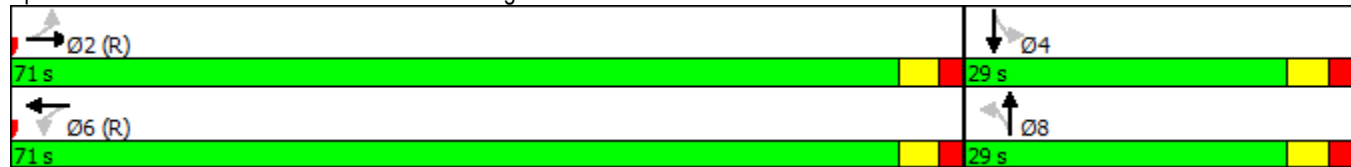


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effect Green (s)		66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio		0.66		0.66	0.66			0.24			0.24	
v/c Ratio		0.32		0.02	0.39			0.17			0.40	
Control Delay		9.4		4.6	5.3			23.4			33.4	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		9.4		4.6	5.3			23.4			33.4	
LOS		A		A	A			C			C	
Approach Delay		9.4			5.3			23.4			33.4	
Approach LOS		A			A			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	100
Control Type:	Pretimed
Maximum v/c Ratio:	0.40
Intersection Signal Delay:	11.7
Intersection LOS:	B
Intersection Capacity Utilization	56.5%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 4: Charles Street South & King Street



Lanes, Volumes, Timings
5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	391	22	43	404	24	25	21	34	44	20	10
Future Volume (vph)	8	391	22	43	404	24	25	21	34	44	20	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			0.96			0.97	
Frt		0.992			0.992			0.943			0.982	
Flt Protected	0.950			0.950				0.985			0.971	
Satd. Flow (prot)	1425	1744	0	1583	1733	0	0	1550	0	0	1683	0
Flt Permitted	0.445			0.455				0.903			0.803	
Satd. Flow (perm)	662	1744	0	755	1733	0	0	1420	0	0	1348	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			6			35			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		204.6			68.0			118.0			53.5	
Travel Time (s)		14.7			4.9			8.5			3.9	
Confl. Peds. (#/hr)	10		5	5		10	2		28	28		2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	20%	2%	6%	8%	3%	0%	9%	0%	3%	0%	6%	0%
Adj. Flow (vph)	9	425	24	47	439	26	27	23	37	48	22	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	449	0	47	465	0	0	87	0	0	81	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)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	16.0	16.0		16.0	16.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lanes, Volumes, Timings
 5: William Street South & King Street

04/12/2018

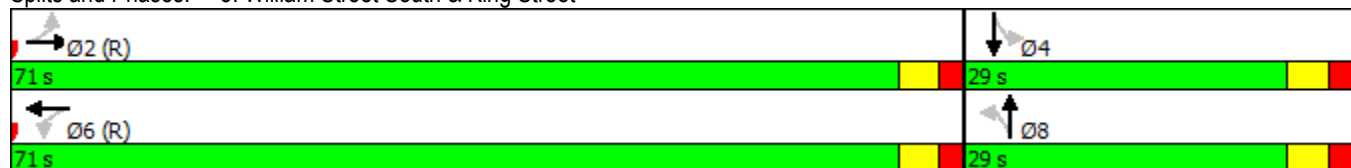


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effect Green (s)	66.0	66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
v/c Ratio	0.02	0.39		0.09	0.41			0.24			0.25	
Control Delay	3.5	5.3		6.8	9.1			21.4			30.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.5	5.3		6.8	9.1			21.4			30.4	
LOS	A	A		A	A			C			C	
Approach Delay		5.3			8.9			21.4			30.4	
Approach LOS		A			A			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	100
Control Type:	Pretimed
Maximum v/c Ratio:	0.41
Intersection Signal Delay:	9.9
Intersection LOS:	A
Intersection Capacity Utilization	64.4%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 5: William Street South & King Street



Lanes, Volumes, Timings
 7: South Street & Charles Street South

04/12/2018



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	0	0	0
Right Turn on Red	Yes	Yes	Yes			Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	499.5			197.6	203.6	
Travel Time (s)	36.0			14.2	14.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25	15	25			15
Turn Type						
Protected Phases						
Permitted Phases						
Minimum Split (s)						
Total Split (s)						
Total Split (%)						
Maximum Green (s)						
Yellow Time (s)						
All-Red Time (s)						
Lost Time Adjust (s)						
Total Lost Time (s)						
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						

Intersection Summary

Area Type: Other

Cycle Length: 3

Actuated Cycle Length: 3

Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green

Natural Cycle: 40

Control Type: Pretimed

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0

Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 7: South Street & Charles Street South

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Lanes, Volumes, Timings

1: South Street

04/12/2018



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	34	5	3	67	6
Future Volume (vph)	0	34	5	3	67	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865		0.949			
Flt Protected						0.956
Satd. Flow (prot)	1469	0	1708	0	0	1721
Flt Permitted						0.956
Satd. Flow (perm)	1469	0	1708	0	0	1721
Link Speed (k/h)	50		50			50
Link Distance (m)	197.6		28.3			47.9
Travel Time (s)	14.2		2.0			3.4
Confl. Peds. (#/hr)		4		8	8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%
Adj. Flow (vph)	0	37	5	3	73	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	0	8	0	0	80
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

1: South Street

04/12/2018



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	34	5	3	67	6
Future Volume (Veh/h)	0	34	5	3	67	6
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	37	5	3	73	7
Pedestrians	8					4
Lane Width (m)	3.6					3.6
Walking Speed (m/s)	1.2					1.2
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	168	18			16	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168	18			16	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	100	96			95	
cM capacity (veh/h)	785	1038			1604	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	37	8	80			
Volume Left	0	0	73			
Volume Right	37	3	0			
cSH	1038	1700	1604			
Volume to Capacity	0.04	0.00	0.05			
Queue Length 95th (m)	0.9	0.0	1.1			
Control Delay (s)	8.6	0.0	6.7			
Lane LOS	A		A			
Approach Delay (s)	8.6	0.0	6.7			
Approach LOS	A					
Intersection Summary						
Average Delay			6.9			
Intersection Capacity Utilization			22.2%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
 2: Water Street/John Street & Stone Street South

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	0	23	0	4	4	15	37	0	0	62	21
Future Volume (vph)	40	0	23	0	4	4	15	37	0	0	62	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865		0.932							0.965
Flt Protected		0.950						0.986				
Satd. Flow (prot)	0	0	1557	0	1342	0	0	1735	0	0	1737	0
Flt Permitted		0.950						0.986				
Satd. Flow (perm)	0	0	1557	0	1342	0	0	1735	0	0	1737	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		59.4			97.0			38.9			528.8	
Travel Time (s)		4.3			7.0			2.8			38.1	
Confl. Peds. (#/hr)	3		5	5		3	17		7	7		17
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%	0%	50%	8%	0%	0%	0%	0%	0%
Adj. Flow (vph)	43	0	25	0	4	4	16	40	0	0	67	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	25	0	8	0	0	56	0	0	90	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

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

HCM Unsignalized Intersection Capacity Analysis

2: Water Street/John Street & Stone Street South

04/12/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	23	0	4	4	15	37	0	0	62	21
Future Volume (Veh/h)	40	0	23	0	4	4	15	37	0	0	62	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	0	25	0	4	4	16	40	0	0	67	23
Pedestrians		17			7			5			3	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	176	174	100	188	186	50	107			47		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	176	174	100	188	186	50	107			47		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.7	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.8	2.3			2.2		
p0 queue free %	94	100	97	100	99	100	99			100		
cM capacity (veh/h)	752	700	943	732	690	890	1427			1564		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	8	56	90								
Volume Left	43	0	16	0								
Volume Right	25	4	0	23								
cSH	813	777	1427	1700								
Volume to Capacity	0.08	0.01	0.01	0.05								
Queue Length 95th (m)	2.2	0.2	0.3	0.0								
Control Delay (s)	9.8	9.7	2.2	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.8	9.7	2.2	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			Err%	ICU Level of Service							H	
Analysis Period (min)			15									

Lanes, Volumes, Timings 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	344	46	47	316	117	30	55	61	111	56	76
Future Volume (vph)	90	344	46	47	316	117	30	55	61	111	56	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.97	0.99		0.97	0.95		0.93	0.97	
Frt		0.982			0.959			0.921			0.914	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1692	0	1644	1650	0	1583	1556	0	1676	1580	0
Flt Permitted	0.349			0.391			0.621			0.656		
Satd. Flow (perm)	612	1692	0	659	1650	0	1003	1556	0	1080	1580	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			25			52			64	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		96.1			200.4			528.8			53.5	
Travel Time (s)		6.9			14.4			38.1			3.9	
Confl. Peds. (#/hr)	8		32	32		8	19		39	39		19
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%	4%	0%	4%	5%	0%	8%	2%	0%	2%	0%	1%
Adj. Flow (vph)	98	374	50	51	343	127	33	60	66	121	61	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	424	0	51	470	0	33	126	0	121	144	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		13.0			13.0			7.0			7.0	
Flash Dont Walk (s)		14.0			14.0			17.0			17.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.25	0.53		0.12	0.60		0.10	0.31		0.34	0.34	
Control Delay	11.1	21.3		15.8	28.2		23.3	20.9		27.6	20.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.1	21.3		15.8	28.2		23.3	20.9		27.6	20.2	
LOS	B	C		B	C		C	C		C	C	
Approach Delay		19.4			27.0			21.4			23.5	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			C			C			C		
Queue Length 50th (m)	8.3	57.7		5.3	60.8		4.5	12.1		17.4	13.1	
Queue Length 95th (m)	15.7	86.9		m13.2	95.8		11.4	28.3		31.5	30.5	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	394	800		414	788		329	412		353	427	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.25	0.53		0.12	0.60		0.10	0.31		0.34	0.34	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 23.0 Intersection LOS: C
 Intersection Capacity Utilization 68.5% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings
4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↕	
Traffic Volume (vph)	21	483	35	26	445	66	10	15	20	135	23	39
Future Volume (vph)	21	483	35	26	445	66	10	15	20	135	23	39
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	60.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.96	1.00			0.96				0.95
Frt		0.991			0.981			0.939				0.974
Flt Protected		0.998		0.950				0.989				0.967
Satd. Flow (prot)	0	1715	0	1710	1710	0	0	1542	0	0	1636	0
Flt Permitted		0.971		0.421				0.924				0.764
Satd. Flow (perm)	0	1669	0	726	1710	0	0	1416	0	0	1260	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			16			22				12
Link Speed (k/h)		50			50			50				50
Link Distance (m)		200.4			204.6			117.4				55.1
Travel Time (s)		14.4			14.7			8.5				4.0
Confl. Peds. (#/hr)	6		60	60		6	61		19	19		61
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%	3%	0%	0%	3%	2%	13%	8%	0%	1%	0%	0%
Adj. Flow (vph)	23	525	38	28	484	72	11	16	22	147	25	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	586	0	28	556	0	0	49	0	0	214	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	11.0	11.0		11.0	11.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio		0.66		0.66	0.66			0.24			0.24	
v/c Ratio		0.53		0.06	0.49			0.14			0.69	
Control Delay		7.7		2.1	5.8			20.4			45.5	
Queue Delay		0.3		0.0	0.0			0.0			0.0	
Total Delay		8.0		2.1	5.8			20.4			45.5	
LOS		A		A	A			C			D	
Approach Delay		8.0			5.6			20.4			45.5	

Lanes, Volumes, Timings
 4: Charles Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			C			D	
Queue Length 50th (m)		69.9		0.5	52.3			4.3				37.7
Queue Length 95th (m)		96.0		m1.0	62.3			13.9				#69.0
Internal Link Dist (m)		176.4			180.6			93.4				31.1
Turn Bay Length (m)				60.0								
Base Capacity (vph)		1103		479	1134			356				311
Starvation Cap Reductn		137		0	0			0				0
Spillback Cap Reductn		0		0	0			0				0
Storage Cap Reductn		0		0	0			0				0
Reduced v/c Ratio		0.61		0.06	0.49			0.14				0.69

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 42 (42%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 13.1
 Intersection LOS: B
 Intersection Capacity Utilization 75.8%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Charles Street South & King Street



Lanes, Volumes, Timings
5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	635	18	36	541	38	20	33	79	64	23	15
Future Volume (vph)	13	635	18	36	541	38	20	33	79	64	23	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	85.0		0.0	25.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	1.00			0.94			0.96	
Fr _t		0.996			0.990			0.919			0.981	
Fl _t Protected	0.950			0.950				0.992			0.969	
Satd. Flow (prot)	1710	1739	0	1710	1744	0	0	1529	0	0	1700	0
Fl _t Permitted	0.341			0.293				0.948			0.727	
Satd. Flow (perm)	608	1739	0	521	1744	0	0	1457	0	0	1232	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			7			70			8	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		204.6			68.0			118.0			53.5	
Travel Time (s)		14.7			4.9			8.5			3.9	
Confl. Peds. (#/hr)	18		25	25		18	11		33	33		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%	0%	0%	2%	0%	0%	3%	1%	0%	0%	0%
Adj. Flow (vph)	14	690	20	39	588	41	22	36	86	70	25	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	710	0	39	629	0	0	144	0	0	111	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8				4
Permitted Phases	2			6			8			4		
Minimum Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	16.0	16.0		16.0	16.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	66.0	66.0		66.0	66.0			24.0			24.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.24			0.24	
v/c Ratio	0.03	0.62		0.11	0.55			0.36			0.37	
Control Delay	4.5	8.3		7.2	11.1			19.5			33.5	
Queue Delay	0.0	0.1		0.0	0.0			0.0			0.0	
Total Delay	4.5	8.4		7.2	11.1			19.5			33.5	
LOS	A	A		A	B			B			C	
Approach Delay		8.3			10.9			19.5			33.5	

Lanes, Volumes, Timings
 5: William Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	A			B			B			C		
Queue Length 50th (m)	0.8	42.8		2.6	60.5			12.1			17.5	
Queue Length 95th (m)	m1.2	60.9		6.9	88.8			29.7			34.3	
Internal Link Dist (m)		180.6			44.0			94.0			29.5	
Turn Bay Length (m)	85.0			25.0								
Base Capacity (vph)	401	1148		343	1153			402			301	
Starvation Cap Reductn	0	49		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.65		0.11	0.55			0.36			0.37	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 12.0
 Intersection LOS: B
 Intersection Capacity Utilization 63.2%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: William Street South & King Street



Lanes, Volumes, Timings
7: South Street & Charles Street South

04/12/2018



Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	0	0	0
Right Turn on Red	Yes	Yes	Yes			Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	499.5			197.6	204.0	
Travel Time (s)	36.0			14.2	14.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Turn Type						
Protected Phases						
Permitted Phases						
Minimum Split (s)						
Total Split (s)						
Total Split (%)						
Maximum Green (s)						
Yellow Time (s)						
All-Red Time (s)						
Lost Time Adjust (s)						
Total Lost Time (s)						
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)						
Actuated g/C Ratio						
v/c Ratio						
Control Delay						
Queue Delay						
Total Delay						
LOS						
Approach Delay						
Approach LOS						
Queue Length 50th (m)						
Queue Length 95th (m)						
Internal Link Dist (m)	475.5			173.6	180.0	
Turn Bay Length (m)						
Base Capacity (vph)						
Starvation Cap Reductn						
Spillback Cap Reductn						
Storage Cap Reductn						

Lanes, Volumes, Timings

3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	236	34	24	271	80	25	118	39	68	97	75
Future Volume (vph)	70	236	34	24	271	80	25	118	39	68	97	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.99	0.99		0.97	0.99		0.98	0.98	
Frt		0.981			0.966			0.963			0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1629	1671	0	1710	1632	0	1613	1640	0	1676	1532	0
Flt Permitted	0.430			0.514			0.538			0.570		
Satd. Flow (perm)	728	1671	0	919	1632	0	890	1640	0	988	1532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			20			16			37	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		96.1			200.4			528.8			53.5	
Travel Time (s)		6.9			14.4			38.1			3.9	
Confl. Peds. (#/hr)	9		4	4		9	12		8	8		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 (%)	5%	6%	0%	0%	7%	0%	6%	6%	0%	2%	7%	7%
Adj. Flow (vph)	76	257	37	26	295	87	27	128	42	74	105	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	294	0	26	382	0	27	170	0	74	187	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)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018

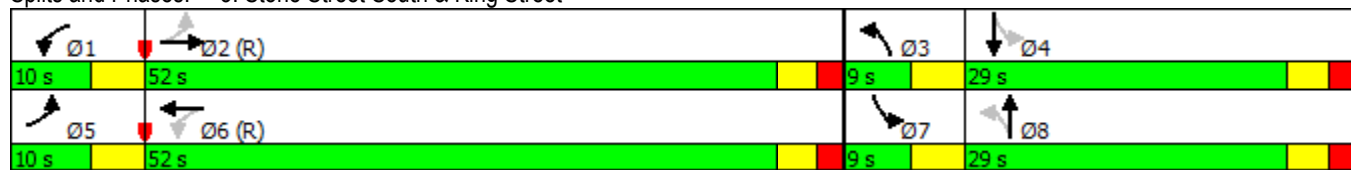


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effect Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.17	0.37		0.05	0.49		0.09	0.42		0.22	0.47	
Control Delay	10.3	18.1		15.7	33.5		23.1	32.7		25.1	30.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.3	18.1		15.7	33.5		23.1	32.7		25.1	30.5	
LOS	B	B		B	C		C	C		C	C	
Approach Delay		16.5			32.4			31.4			29.0	
Approach LOS		B			C			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	87 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	100
Control Type:	Pretimed
Maximum v/c Ratio:	0.49
Intersection Signal Delay:	26.7
Intersection LOS:	C
Intersection Capacity Utilization	65.8%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 3: Stone Street South & King Street



Lanes, Volumes, Timings 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	424	46	47	391	117	30	135	61	111	133	76
Future Volume (vph)	90	424	46	47	391	117	30	135	61	111	133	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	35.0		0.0	30.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	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		0.98	0.99		0.97	0.97		0.95	0.98	
Frt		0.985			0.965			0.954			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1698	0	1644	1659	0	1583	1642	0	1676	1659	0
Flt Permitted	0.278			0.313			0.462			0.489		
Satd. Flow (perm)	488	1698	0	531	1659	0	751	1642	0	816	1659	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			20			21				27
Link Speed (k/h)		50			50			50				50
Link Distance (m)		96.1			200.4			528.8				53.5
Travel Time (s)		6.9			14.4			38.1				3.9
Confl. Peds. (#/hr)	8		32	32		8	19		39	39		19
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%	4%	0%	4%	5%	0%	8%	2%	0%	2%	0%	1%
Adj. Flow (vph)	98	461	50	51	425	127	33	147	66	121	145	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	511	0	51	552	0	33	213	0	121	228	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (s)	10.0	52.0		10.0	52.0		9.0	29.0		9.0	29.0	
Total Split (%)	10.0%	52.0%		10.0%	52.0%		9.0%	29.0%		9.0%	29.0%	
Maximum Green (s)	6.0	47.0		6.0	47.0		5.0	24.0		5.0	24.0	
Yellow Time (s)	4.0	3.0		4.0	3.0		4.0	3.0		4.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Walk Time (s)		13.0			13.0			7.0			7.0	
Flash Dont Walk (s)		14.0			14.0			17.0			17.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.0	47.0		54.0	47.0		30.0	24.0		30.0	24.0	
Actuated g/C Ratio	0.54	0.47		0.54	0.47		0.30	0.24		0.30	0.24	
v/c Ratio	0.29	0.64		0.14	0.70		0.12	0.52		0.42	0.55	
Control Delay	11.9	24.3		17.1	34.3		23.6	34.9		29.7	34.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.9	24.3		17.1	34.3		23.6	34.9		29.7	34.8	
LOS	B	C		B	C		C	C		C	C	
Approach Delay		22.3			32.8			33.4			33.0	

Lanes, Volumes, Timings
 3: Stone Street South & King Street

04/12/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C				C				C		
Queue Length 50th (m)	8.3	75.2		6.1	83.1		4.5	34.0		17.4	35.8	
Queue Length 95th (m)	15.7	111.8		m12.1	120.1		11.4	57.7		31.5	60.6	
Internal Link Dist (m)		72.1			176.4			504.8			29.5	
Turn Bay Length (m)	30.0			35.0			30.0			35.0		
Base Capacity (vph)	334	801		353	790		266	410		287	418	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.29	0.64		0.14	0.70		0.12	0.52		0.42	0.55	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 29.4 Intersection LOS: C
 Intersection Capacity Utilization 76.2% ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Stone Street South & King Street

