Transportation

Halifax Regional Municipality

Spring Garden Road Area Transportation Study – Phase 2 Report

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Project Number:
60144708

Date: May 2010

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May 3, 2010

Mr. Roddy MacIntyre, P.Eng.
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Dear Mr. R. MacIntyre

Project No: 60144708

Regarding: Spring Garden Road Area Transportation Study – Phase 2 Report

AECOM Canada Ltd. is pleased to submit to the Halifax Regional Municipality 4 copies of the final version of the Phase 2 Study Report for the Spring Garden Road Area Transportation Study along with a pdf copy on CD. The CD provided also includes the Synchro traffic models, spreadsheets used for calculations, traffic data that was collected and AutoCad versions of the figures in the report.

Sincerely,
AECOM Canada Ltd.

Ray Rice, P.Eng.
Department Manager
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Encl.

Distribution List

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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
1	VS	May 3, 2010	Client comments addressed
2	VS	May 7, 2010	Quality audit comments addressed

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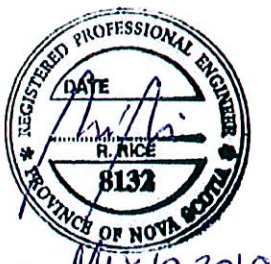


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1. Introduction

1.1 Background

AECOM Canada Ltd. was retained by the Halifax Regional Municipality (HRM) to undertake a transportation study for the Spring Garden Road area in Halifax. The purpose of this study was to identify and assess the potential impacts to the area transportation network due to new development and a proposed one-way street system. The study will be completed in two phases, with this report summarizing the findings and analyses of Phase 2.

The first phase of the study examined operational impacts in the study area based on several road network modification scenarios and existing traffic volumes. Phase 2 of the study examined the impacts on the roadway network within the study area based on future traffic projected to 2020 and will consider both background traffic growth and development traffic growth from proposed developments in the area. The background traffic growth is traffic growth in the study area based on the increase in development in the entire Halifax Regional Municipality. The development traffic is related to the several anticipated development projects directly in the study area, including a new central library projected to open by 2013. An operational assessment of the study area road network, both modified and unmodified, will be completed in order to determine the impacts resulting from proposed development traffic.

1.2 Project Need & Objectives

The proposed developments in the Spring Garden Road area (central library, residential and commercial) will increase traffic volumes on the study area road network. This transportation study will determine whether roadway modifications are necessary in order to provide adequate traffic flow through the area due to the anticipated developments.

The objective of this study is to provide traffic operational analysis based on four roadway configuration scenarios. The scenarios are:

- Scenario A - The existing road layout and traffic control system is considered Scenario A. This is the base scenario which will be used as a comparison against which all other scenarios will be measured.

- Scenario B - Scenario B encompasses the proposed streetscape design for Spring Garden Road. Sidewalks are widened at the intersections of Brenton Street, Dresden Row and Birmingham Street thereby narrowing the roadway at these intersections, which has the effect of eliminating the de facto left turn lane in the eastbound and westbound directions. For this reason, left turns will be prohibited at Dresden Row. In addition, a dedicated left turn lane will be added in the eastbound direction at the intersection of Queen Street and Spring Garden Road.

- Scenario C - Scenario C is based on plan proposed by the Spring Garden Area Business Association to convert some roads in the study area to one-way streets. In this scenario, Dresden Row and Birmingham Street will become one-way streets from Sackville Street to Clyde Street for southbound and northbound traffic respectively. A traffic signal will be added at the intersection of Sackville Street and Queen. Doyle Street will become a westbound one-way street, while Artillery Place will become a one-way street in the eastbound direction. Brenton Place and Clyde Street will change from a one-way street to a two-way street between South Park and Dresden Row, therefore allowing two-way traffic between South Park Street and Queen Street.

- Scenario D - Scenario D combines the modifications described in Scenarios B and C. This option will encompass the streetscape design for Spring Garden Road and the proposed one-way street system.

Phase 1 of the transportation study involved the assessment of present day traffic on Scenarios A through D. Examining the scenarios with existing traffic conditions was the first step in determining if the scenarios are viable options. In Phase 2 of the study, an operational assessment of the study area network for unmodified and modified conditions was carried out to assess the impacts of traffic expected to be generated from proposed study area developments. Two traffic volume scenarios were prepared for analysis based on different estimates of traffic growth. The first scenario will include traffic growth based only on overall growth

in the area (background growth) and the second scenario will contain traffic volumes based on background growth plus development generated traffic.

The completion of this study is critical in the timeline of many related projects in the area. The impacts of each of the modification scenarios discussed in this study will be used to move forward with local development projects and road modification projects.

2. Site Characteristics

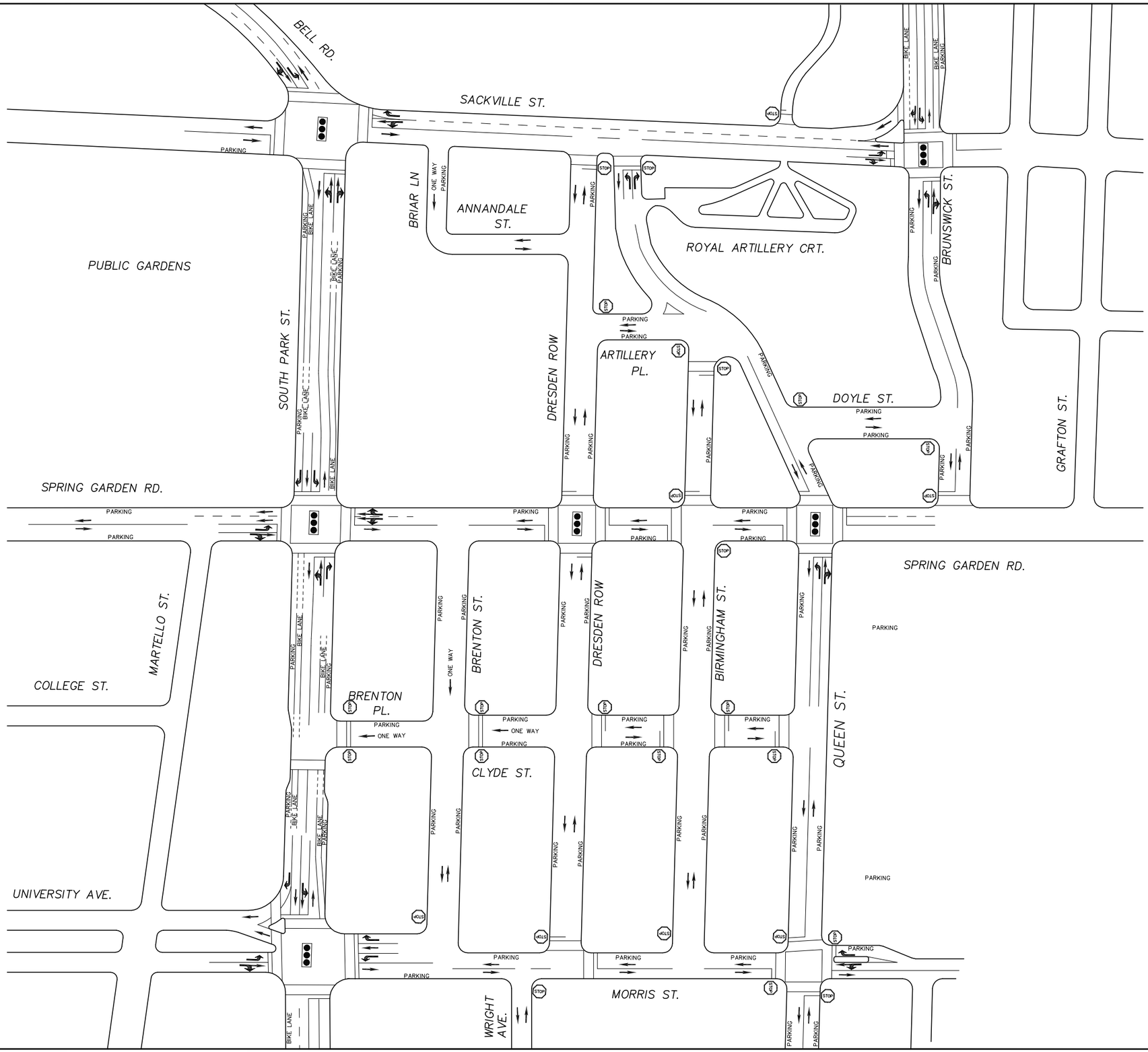
The study area is bounded by Sackville Street to the north, Morris Street to the south, South Park Street to the west and Queen Street to the east as shown in **Figure 1**. This area of Halifax is a busy section of the downtown area. Primary tourist attractions in the vicinity include the Public Gardens, the Citadel and Dalhousie University. The north section of the study area is primarily a commercial district with a large number of shops and restaurants. Many unique stores line the streets which provide an exceptional shopping experience. The south part of the study area is dominated by residential buildings, including several heritage structures, and also contains a primary school. The commercial nature of the study area results in a high demand for parking. On-street parking is generally permitted along many of the streets in the study area. There are also several large surface parking lots as well as underground parking available for patrons. Entrances to surface parking lots are located on Dresden Row and on Birmingham Street just north of the Clyde Street intersections. Another surface parking lot entrance is located at the Queen Street/ Clyde Street intersection. Underground parking is available at Birmingham Street just south of the Queen Street/Artillery Street intersection and at Annandale Street.

The majority of streets in the study area are two-lane, bi-directional roads, with a few exceptions. Brenton Place, Briar Lane, Brenton Street, (between Spring Garden Road and Clyde Street), and Clyde Street, (between Brenton Street and Dresden Row) are one-ways roads. South Park Street is the only road in the study area that incorporates bicycle lanes, which are located between Sackville Street and Morris Street. There are six signalized intersections in the study area, located at:

- South Park Street/ Sackville Street
- South Park Street/ Spring Garden Road
- South Park Street/ Morris Street
- Spring Garden Road/ Dresden Row
- Spring Garden Road/ Queen Street
- Sackville Street/ Brunswick Street

The remaining intersections are controlled with stop signs on the minor road except at the Queen Street/ Morris Street intersection which is a four-way stop controlled intersection.

Spring Garden Road is a main transit link served by twenty-one routes and South Park Street also has several transit routes. The many shops and boutiques in the area also contribute to large pedestrian volumes. Along Spring Garden Road and at some of the intersections along Clyde Street, there is more pedestrian traffic than vehicular traffic as shown in **Figure 2**. These pedestrians affect intersection operations since they can often cause delays to the vehicles waiting at stop signs. The existing vehicular traffic volumes are shown in **Figure 3**.



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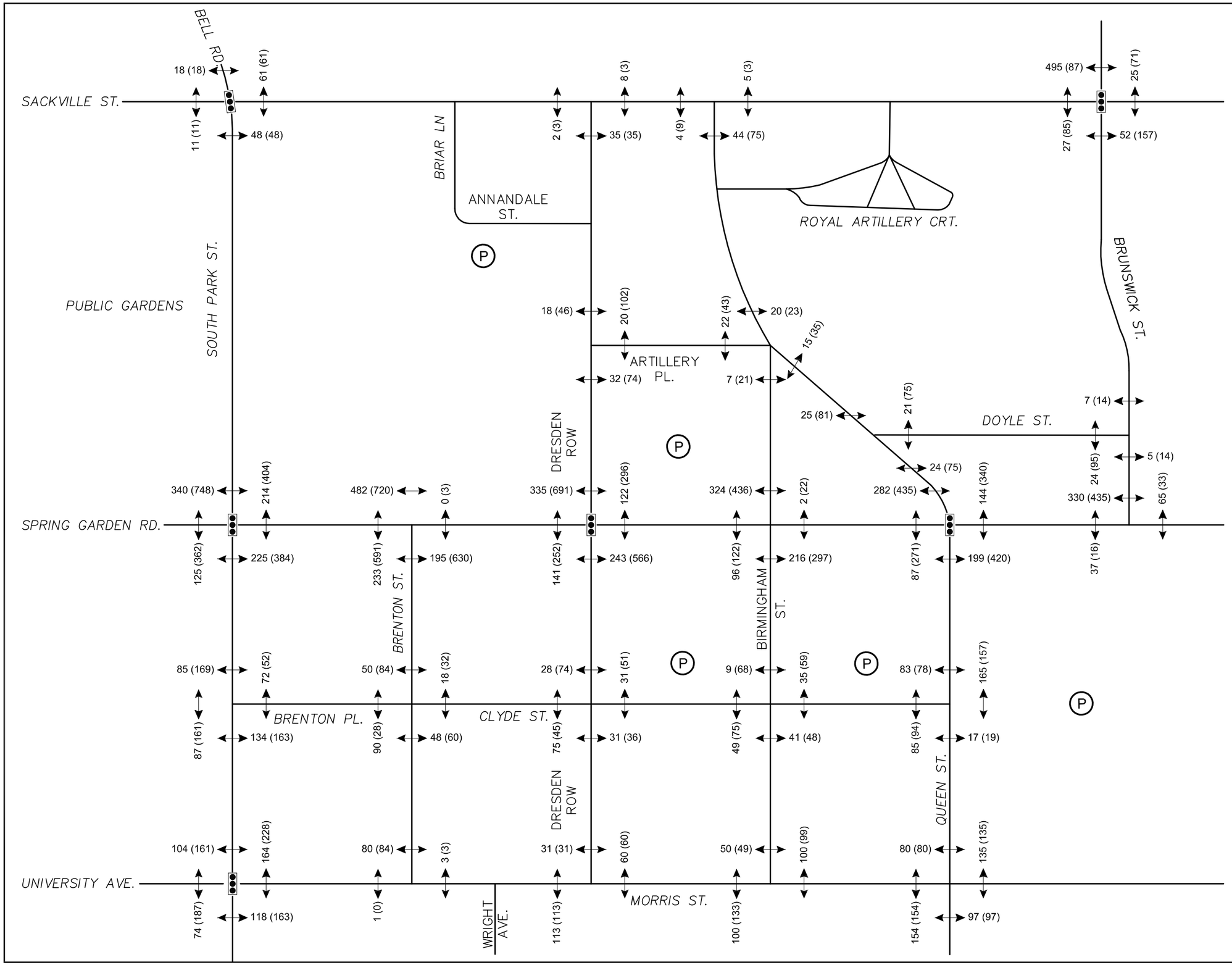
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Transportation Study
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NORTH

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LEGEND

- ↔ Direction of Crossing
- 50 AM Pedestrian Volumes
- (75) PM Pedestrian Volumes

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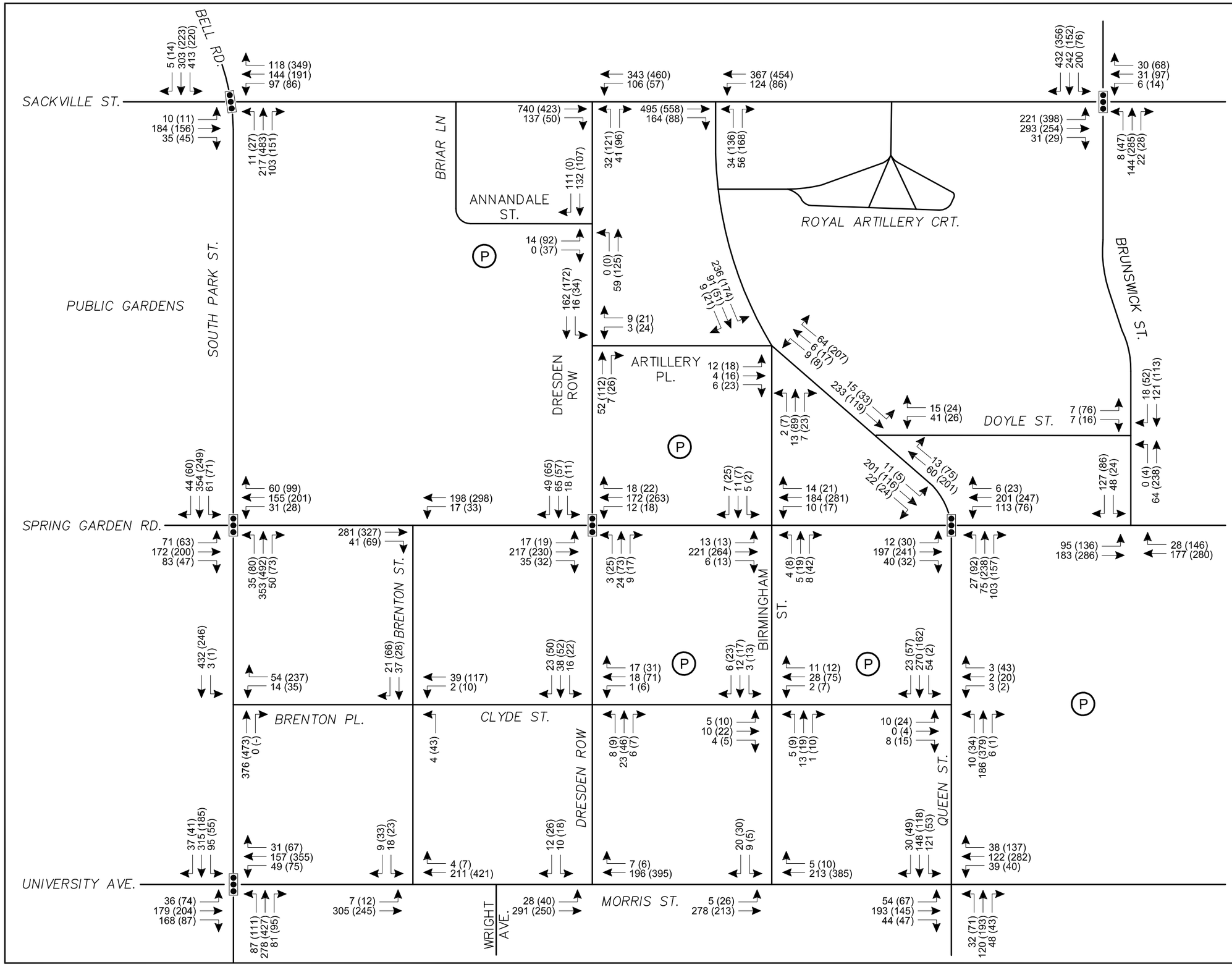
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PEDESTRIAN VOLUMES

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NORTH

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LEGEND

- Right Turn
- Through
- Left Turn

50 AM Traffic Volumes

(75) PM Traffic Volumes

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EXISTING
TRAFFIC VOLUMES

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3. Methodology

3.1 Phase 1

Phase 1 of the Spring Garden Road Area Transportation Study related to the existing traffic situation.

Traffic counts were undertaken in January 2010 in order to supplement volume data available from the existing HRM traffic model. The HRM traffic model was developed in 2008 using Synchro 6.0 intersection capacity analysis software and was based on a previous model from 2004. The 2008 version updated the traffic volumes and increased the number of intersections in the traffic model. For this study, vehicle and pedestrian volumes were collected during the a.m. and p.m. peak hours that aligned with the peak hours indicated in the existing Synchro model. These volumes were at minor intersections with lower volumes and were rationalized with the existing volumes in the Synchro model. Jamar handheld traffic data collectors were used for the majority of the fourteen intersection counts and Miovision cameras and software were used to collect data at the remaining four intersections.

The 2008 Downtown Halifax Synchro model was used to evaluate the Level of Service (LOS) at each intersection in the study area, which is determined based on the average delay per vehicle. The model was reduced in size to include only the intersections in the study area and the immediately surrounding area. All other aspects of the model were retained including lane arrangement, intersection control, heavy vehicle percentages, peak hour factors, and saturation flow rates for the scenario analyses. The existing conditions scenario, described as Scenario A, contained twenty-six intersections of which six were controlled by traffic signals. The model was used to perform the traffic analyses for both the a.m. and p.m. peak hour traffic flows. The peak hour traffic flows were entered for each intersection individually rather than selecting a peak hour for the overall area. This method is consistent with that used to input peak hour traffic volumes for the 2008 traffic model. The performance of each intersection was described in terms of delay using the Highway Capacity Manual (HCM) 2000 standards.

Once the existing conditions were analysed, the traffic was redistributed as per the modified scenarios described previously as Scenarios B through D. Traffic reassignment patterns were developed for each scenario recognizing the available capacities and network restrictions. The figures describing the redistribution of the traffic are presented in **Appendix A**. The redistributed traffic volumes were input into the traffic model and the results of the intersection operations analyses for the Scenarios B through D for both the a.m. and p.m. peak hours were tabulated. The cost of the proposed modifications for the one-way street scenario was evaluated

A comparative table indicating the delays at each intersection for the four scenarios was prepared and the results were reviewed to determine where improvements were required. Several alternative solutions were investigated to address the traffic issues at each intersection. These modifications to the scenarios were then assessed in order to evaluate the potential for improved traffic flow.

3.2 Phase 2

Phase 2 of the Spring Garden Road Area Transportation Study concerns the road network operations based on the traffic growth expected over the next 10 years related to both background traffic and development traffic.

Future background traffic was estimated using an annual growth rate related to expected growth in HRM and adjacent areas and was therefore applied to all traffic movements in the study area. This future traffic was added to the existing traffic and an operational analysis was performed for the intersections in the study area. The analysis was performed for each of the four roadway scenarios described as Scenario A through D using the Synchro model referred to in the description of Phase 1 of the study.

Future development traffic estimates were calculated based on information concerning the expected development in the study area. Two private development sites and five publicly owned sites are proposed for development over the next ten years. Trips generated by these sites were assigned to the network. These trips were then added to the future traffic estimated using the overall growth rate for the area and a total number of trips was determined.

Intersection operations were analysed based on the future traffic estimates and the impacts on the road network were identified. Several potential solutions were investigated and the intersection operations in the study area were assessed based on the suggested modifications. Solutions which produced positive results both in terms of operations and in terms maintaining parking and access to businesses and residences were retained.

4. Traffic Projections

An assessment of future traffic projections for the year 2020 was carried out through a two-step process. The first part of the process determined an overall growth rate for the Halifax Regional Municipality which was then applied to traffic volumes. The second aspect in the assessment of traffic growth was related to trips generated by specific development projects that are in the planning stages. The total number of future trips is the sum of the traffic generated from the proposed future developments and the forecasted traffic based on background growth.

4.1 Background Traffic Growth

Background traffic growth represents the increase in traffic from development growth located outside the study area. The growth rate was determined through a regression analysis based upon the overall population growth within the surrounding HRM area and projected population forecasts. The population and forecast data was retrieved from census population data from Statistics Canada and a research paper conducted by Clayton Research *et al.* 2004. The annual growth rate was determined to be 0.9%. This growth rate was applied to the existing traffic volumes to estimate future conditions for the horizon year 2020.

4.2 Development Traffic

Traffic from planned development in the study area was assessed in order to determine the total amount of traffic in the horizon year of 2020. There are several projects anticipated within the Spring Garden Road area which will generate traffic, including private development projects and the development of certain public lands.

The public development projects will occupy five potential sites within the study area which are:

- Birmingham Street parking lot (along Clyde Street between Birmingham Street and Queen Street);
- Dresden Row parking lot (along Clyde Street between Dresden Row and Birmingham Street);
- New library location (southeast corner of Spring Garden Road/Queen Street intersection);
- Old Infirmary site (along Queen Street, situated south of the new library location); and
- Old library location (northeast corner of Spring Garden Road/Brunswick Street).

The private development projects are:

- Trillium Development (northeast corner of Brenton Place and South Park Street);
- City Centre Atlantic Development (Birmingham Street between Artillery and Spring Garden Road);

These locations are illustrated in **Figure 4**.



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PROPOSED FUTURE DEVELOPMENT

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Public Development Sites

The Birmingham Street lot and the Dresden Row lot are collectively known as the Clyde Street parking lots and provide parking for the customers of the retail merchants along Spring Garden Road. These lots are situated between a residential neighbourhood to the south and low to mid-rise retail properties to the north. The two lots are managed by the Spring Garden Road Area Business Association. Together, these parking lots offer a total of 210 surface parking spaces for use, or 79 spaces provided from the Birmingham lot and 131 spaces from the Dresden lot.

The site on Queen Street, previously occupied by the Old Halifax Infirmary, is currently utilized for parking and contains 285 pay parking spaces. The site for the new central library is also currently a pay parking lot with total of 110 spaces.

Each of the five locations will consist of mixed commercial and residential usage with active ground floor retail uses to encourage an active and lively streetscape. The encouragement of introducing a mix of housing units will increase the residential density within the downtown core promoting a safe and liveable downtown. The development will incorporate public parking facilities in support of the Spring Garden Road Area Business Association and at a minimum replace the public parking spaces on the existing lots.

To assist in the promotion of downtown residential properties, Policy 8 of the Secondary Municipal Planning Strategy (Draft) aims to provide affordable residential units through what is referred to as height bonuses. The height bonus allows for the design of taller buildings with alternate building footprints. The pre-bonus height for all sites is approximately 22m (70'), whereas the post-bonus height allows for total height of up to 28m (90'). There are several benefits to the post-bonus building designs. The following are categories of post-bonus height public benefits that are relevant to each property:

- Old Halifax Infirmary – The provision of open space, public parking, and a display area for public art;
- Clyde Street parking lots – The provision of public parking facilities and additional display area for public art; and
- Existing Spring Garden Road Memorial Library – The enhancement of this heritage building, the potential for rental space with subsidies for arts and cultural users.

In determining which development square footage data to utilize for trip generation, the post-bonus height development areas were used to calculate and determine the development trips. The larger square footage from the post-bonus designs assumes a worst case scenario accounting for the largest amount of trips that may be potentially generated from these developments.

Of the five development sites a breakdown of the planned space usage is detailed below:

Birmingham Parking Lot:

- Retail – 28,000 square feet (SF);
- Residential – 116,100 SF

Dresden Parking Lot:

- Retail – 37,300 SF;
- Residential – 155,900 SF

New Library Location:

- Retail/Institutional – 12,500/20,000 SF;
- Office/Institutional – 130,000 SF

Old Infirmary Site:

- Retail – 45,000 SF;
- Residential – 138,400 SF

Existing Library Site:

- Addition of residential – 27,400 SF (Pre-bonus design)

In total the development at the five potential sites will total:

- Retail – 147,000 SF;
- Library – 150,000 SF;
- Residential Apartments – 413,500 SF or 404 Units

Private Development Sites

The Trillium Development is proposed at the northeast corner of South Park Street/Brenton Place. The proposed mixed used development will include specialty retail space, office space, and residential condominium units. Construction at this site was underway in 2010. Because this development is in close proximity to the shops and transit facilities along Spring Garden Road, it is anticipated that there will be high proportion of trips made by foot and by transit.

The City Centre Atlantic Phase III Development consists of more apartment units to be added to the existing City Centre Atlantic complex. The complex is situated between Dresden Row and Birmingham Street south of Artillery Place and north of Spring Garden Road with vehicular access on Birmingham Street. The additional apartment units will add five floor levels that will be constructed above the existing complex. Similar to the Trillium Development, it is anticipated that there will be an increased amount of foot trips and transit usage due to the proximity to Spring Garden Road.

4.2.1 Trip Generation

Trip generation rates were taken from the Institute of Transportation Engineers (ITE) Trip General Manual, 8th Edition, 2008. The manual provides rates for many land uses and the land use types selected from the manual were estimated to be the best matches for the anticipated development projects.

High-rise Apartment

In determining the number of trips generated from high-rise apartments, the lower published range of average trip rates for ITE land use code #222 have been used to account for the expected high number of pedestrian trips and increased transit usage by residents.

High-rise Condominium/Townhouse

In regards to the trips rates used to estimate trips for a high-rise condominium/townhouse, 50% of the published average trip rates from ITE land use code #232 have been used to account for the expected higher number of pedestrian trips and the increased transit usage due to the proximity of Spring Garden Road.

Office Space

The average trip rates provided for office space usage do not cater to the downtown Halifax geographic area as these generic rates were taken from sample areas predominately located within suburban areas where transit usage is non-existent or negligible. In using ITE land use code #710, the lower range rates have been utilized to estimate the AM and PM peak period site generated trips.

Mixed Use Retail

The planned re-development in the Spring Garden Road area encompasses a liveable streetscape design. As such, these developments will house retail boutiques. Land use code #814, specialty retail, has been utilized to account for the mixed retail

use as these developments will have an active ground floor of retail space. The Spring Garden Road area core is predominately a pedestrian oriented area, therefore the lower range trip rates have been used to estimate PM peak hour site trips. No published trip rates exist for this land use during the AM peak period therefore AM trip rates have been assumed to be 50% of the PM trip rate with a reversal of the directional split. This provides a reasonable estimation of trips since the AM peak hour trips to specialty retail are generally quite low.

Library

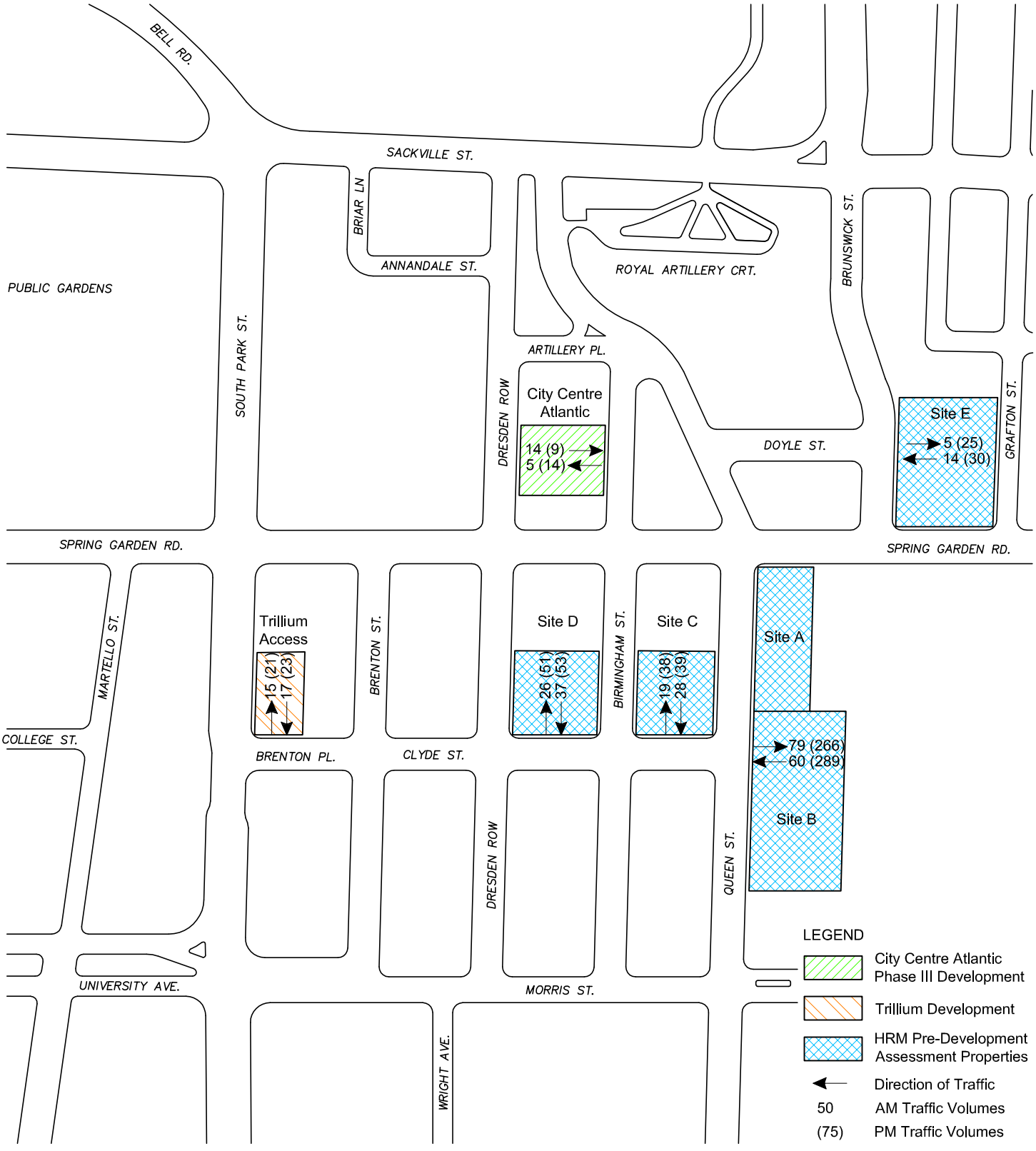
In determining the site trips generated by the new library development, 75% of the lower published range of average trip rates was used from land use code #590. It was assumed that transit use will account for 25% of the trips generated by the library as per the target established in the HRM Regional Plan.

Considering all potential developments within the Study Area, a summary of trip generation estimates is presented below in **Table 1** and is shown in **Figure 5**.

Table 1 Trip Generation Estimates

Description	Land Use	ITE Land Use	Quantity	Unit of Measure[1]	Trip Generation Rates[2]				Trips Generated[3]			
					AM Peak		PM Peak		AM Peak		PM Peak	
					In	Out	In	Out	In	Out	In	Out
City Centre Atlantic Phase III Development	High Rise Apartments	222	100	Units	0.05	0.14	0.14	0.09	5	14	14	9
Trillium Development	Condominium	232	80	Units	0.03	0.14	0.12	0.07	2	11	10	6
	Office	710	12.4	KGLA	0.53	0.07	0.08	0.41	7	1	1	5
	Retail	814	11.1	KGLA	0.57	0.45	0.89	1.14	6	5	10	13
HRM Pre-Development Assessment Report (Post-bonus Density)	Retail	814	147	1000 sq. ft	0.57	0.45	0.89	1.14	84	66	131	168
	Library	590	150	1000 sq. ft	0.28	0.11	1.33	1.43	42	17	200	215
	Condominium	232	404	Units	0.03	0.14	0.12	0.07	12	57	48	28
TOTALS									***158***	***171***	***414***	***444***

1. Measurement units are as indicated; Units – Dwelling Units; KGLA – 1000 sq. ft Gross Leasable Area
2. Trip generation rates are “vehicles per hour per unit”
3. Vehicles per hour for peak hours



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DEVELOPMENT TRIPS GENERATED

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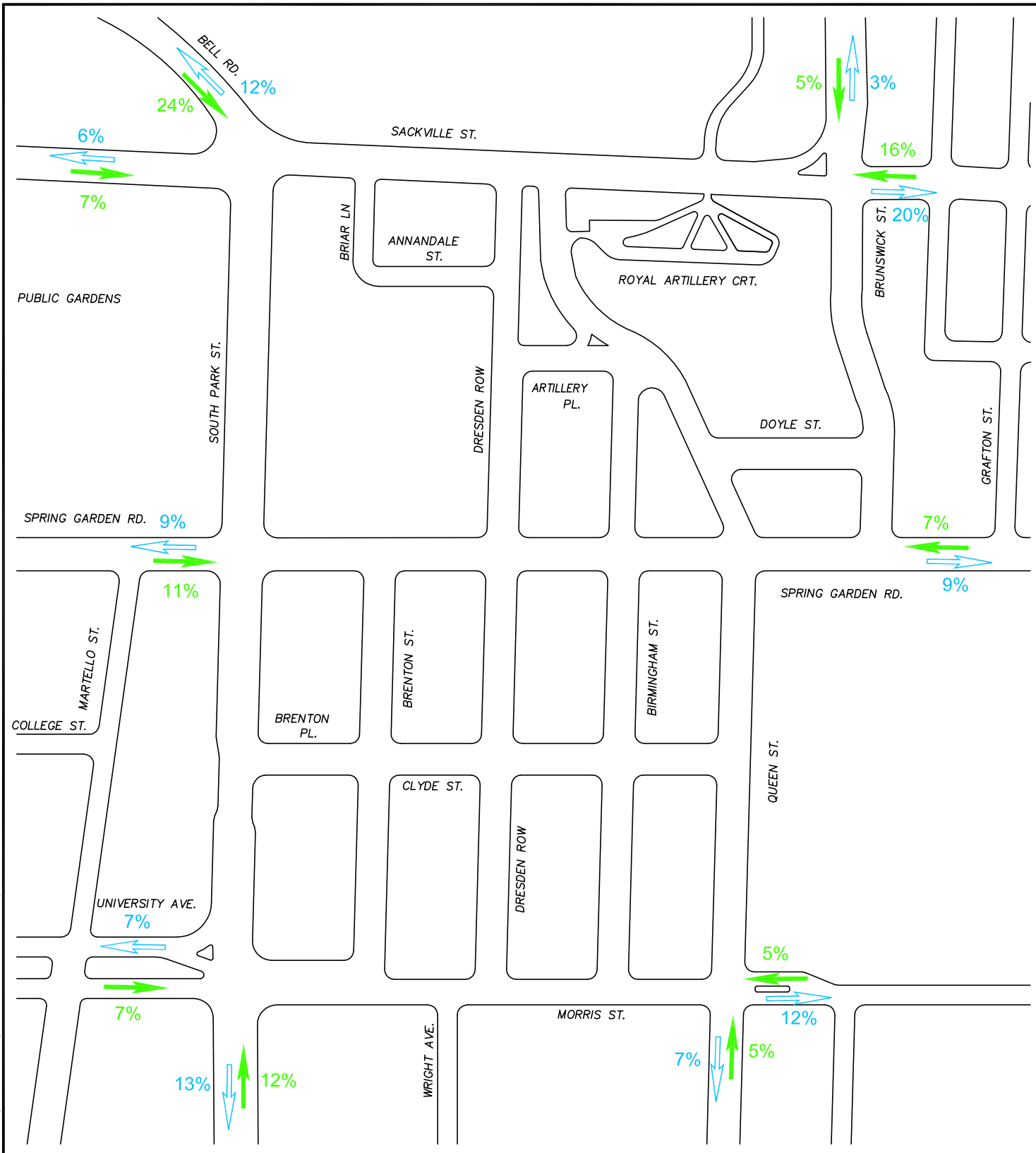
4.2.2 Trip Distribution and Assignment

Trip distribution involves the assignment of the new site trips generated from the proposed developments into and out of the study area. Existing traffic patterns were used as the basis for assigning site traffic arriving and departing the study area road network. The location of the study area relative to the rest of the HRM and the existing road network was factored into the calculation of where trips entered into the network. **Table 2** provides a summary of the percentage of trips arriving and leaving the study area as per existing traffic patterns.

Table 2 Distribution Patterns - AM and PM Peak Periods

Description	AM		PM	
	Enter	Exit	Enter	Exit
East/West along Sackville Street				
West of South Park Street	7%	6%	6%	6%
East of Brunswick Street	16%	20%	15%	19%
East/West along Spring Garden Road				
West of South Park Street	11%	9%	9%	9%
East of Brunswick Street	7%	9%	12%	8%
East/West of Morris Street				
East of South Park Street	7%	7%	8%	11%
East of Queen Street	5%	12%	12%	5%
North/South along South Park Street				
North of Sackville Street	24%	12%	12%	22%
South of Morris Street	12%	13%	14%	7%
North/South along Brunswick Street				
South of Sackville Street	5%	3%	5%	8%
North/South along Queen Street				
South of Morris Street	5%	7%	7%	4%
TOTAL	**100%**	**100%**	**100%**	**100%**

The generated site traffic from the proposed developments is assigned to the study area road network as shown in **Figure 6** and **Figure 7** according to the distribution in **Table 2**. For the base scenario, the generated site traffic from the proposed developments was assigned to the study area road network, into and out of the study area, using a route analysis based on the estimated shortest travel path and travel time. This is considered to be one or more reasonable paths that the majority of traffic would travel. If more than one reasonable path is available, then the assigned traffic was split between the available similar routes. The traffic was then redistributed using the same modified scenarios described previously as Scenarios B through D. The figures describing the redistribution of the traffic are presented in **Appendix A**.



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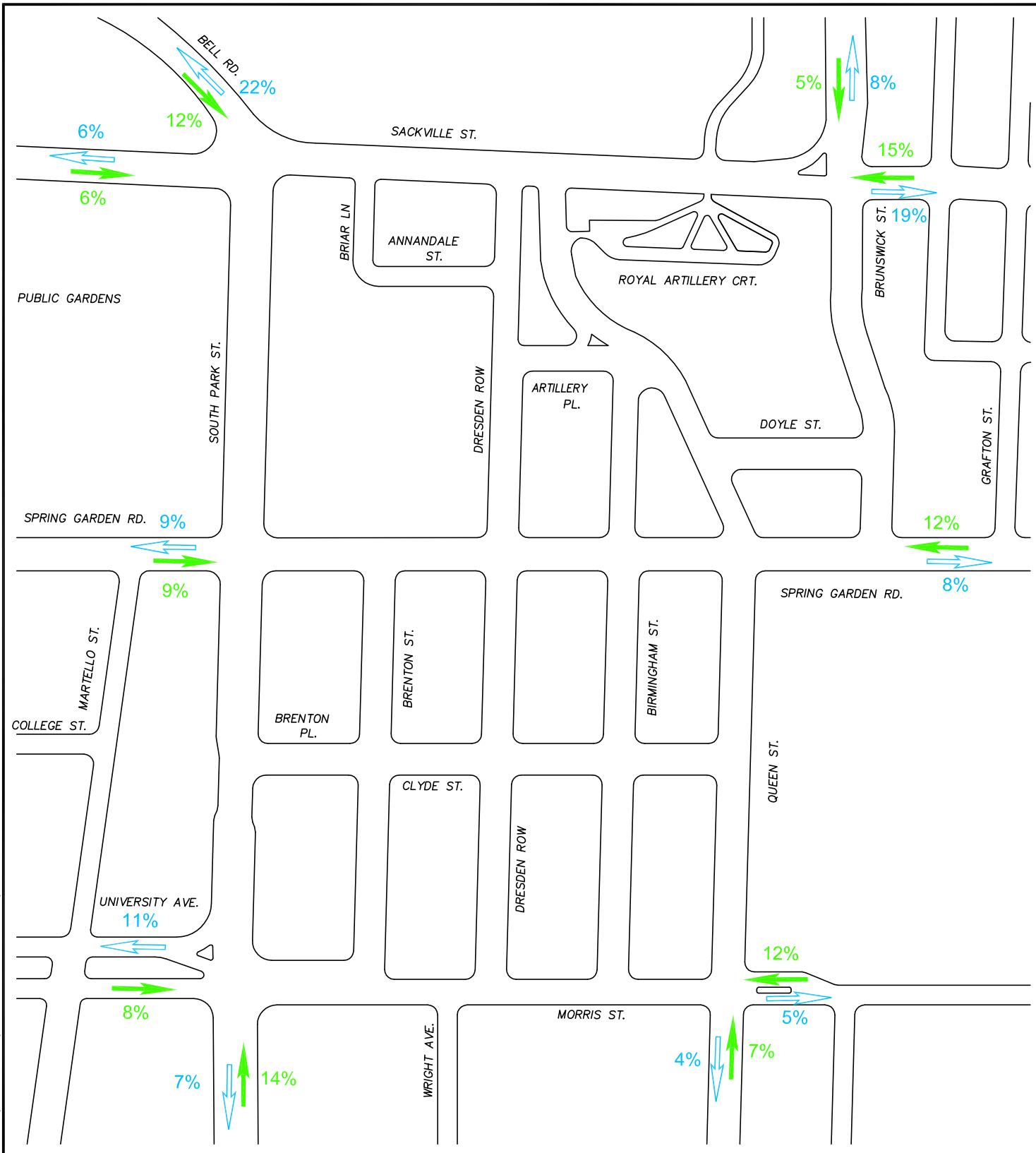
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DISTRIBUTION PATTERN AM PERIOD

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DISTRIBUTION PATTERN PM PERIOD

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5. Network Operations

The capacity of a road network is often described in terms of a level of service for both intersections and roadways. A level of service is determined based on the average delay that a vehicle experiences in passing through an intersection or along a section of road. LOS "A" designates an excellent level of service with little delay, while LOS "F" indicates a poor level of service and significant delay.

The acceptable length of delay at a stop-controlled intersection is less than the acceptable length of delay at an intersection controlled by traffic signals because vehicles at a stop sign must wait until they find a suitable gap in traffic to enter the main roadway where traffic signals will eventually provide a dedicated phase for drivers to proceed. The lower acceptable delays at stop controlled intersections reflect the fact that long delays at stop signs can cause driver frustration and can lead to aggressive driving behaviour and an increased collision risk. The average vehicle delay time and the corresponding level of service is shown in **Table 3**.

Table 3 Level of Service Criteria

Control Delay Per Vehicle (seconds)		
LOS	**Signalised Intersections**	**Stop Controlled Intersections**
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

The intersections in the Spring Garden area were analysed using both the Synchro and SimTraffic modelling software. The results from both SimTraffic and Synchro were then compared. The Synchro results were used, as they seemed to better reflect the actual situation since at some intersections the delay results produced by SimTraffic indicated delay of over 2 minutes at stop controlled intersections, which is greater than that which would be acceptable to HRM. The delays are reported as per HCM (Highway Capacity Manual) calculations except for the intersection of Artillery/Queen/Birmingham where the unusual configuration could not be analysed using Synchro. For this intersection, the SimTraffic delay results were included in the analysis.

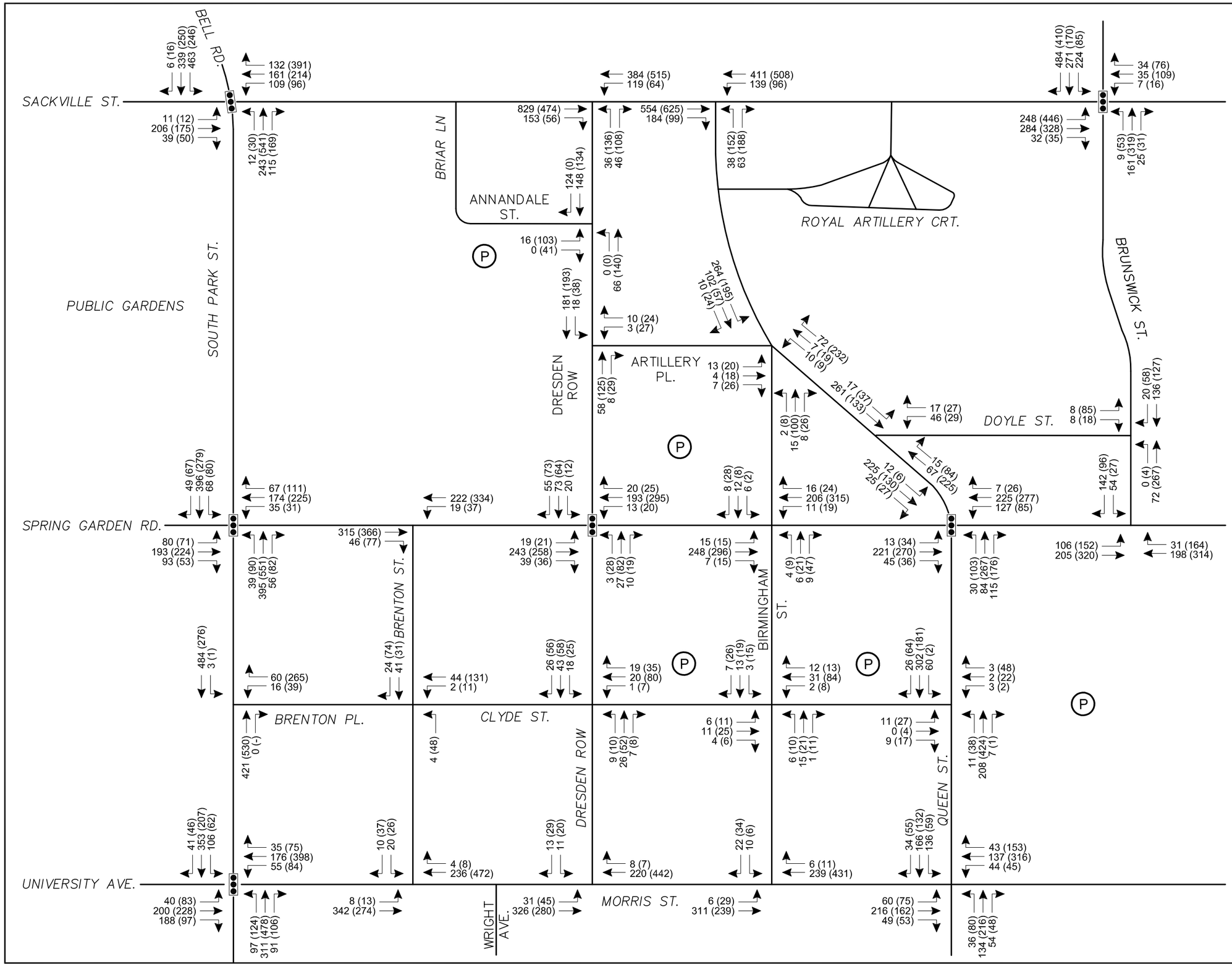
The approaches with poor levels of service ("E", "F") were identified but since a high delay for a low volume should not be equally compared to a high delay for a high volume, it was decided that vehicle-hours of delay would be used to compare the intersections for all scenarios. Each intersection was reviewed for changes in overall delay based on the different scenarios. Many intersections had relatively stable results; however, at the intersections where there were significant changes in delay, modifications were proposed and then analysed in more detail. Traffic signal timing was not optimized for the analysis of the scenarios with background traffic growth and the scenarios with background traffic growth and development traffic; however, the analysis of the scenarios which included modifications, incorporated traffic signal optimization.

5.1 Future Scenarios with Background Growth

An operational analysis was performed on the intersections in the study area for the traffic volumes projected for the year 2020 based on the background growth anticipated in the HRM.

5.1.1 Scenario A

The existing road layout and traffic control system is considered Scenario A. This is the base scenario which will be used as a comparison against which all other scenarios will be measured. The projected traffic volumes for Scenario A in the year 2020 are shown in **Figure 8**.



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PROJECTED TRAFFIC VOLUMES

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The detailed results of the intersection analysis for Scenario A are presented in **Appendix B**. Intersections exhibiting a poor level of service are summarised in **Table 4.**

Table 4 Scenario A Intersections with Poor LOS

AM period	PM period
Sackville St. - Dresden Row	Sackville St. - Dresden Row
Sackville St. - Queen St.	Sackville St. - Queen St.
Sackville St. - Brunswick St.	Sackville St. - Brunswick St.
Spring Garden Rd. - Birmingham St.	Spring Garden Rd. - Birmingham St.
Spring Garden Rd. - Brunswick St.	Spring Garden Rd. - Brunswick St.
	Brenton Pl. - South Park St.
	Clyde St. - Queen St.
	Morris St. - Queen St.

Intersection	Problematic movements	Delay (seconds)	LOS
Sackville St. - Dresden Row	Northbound	250.7 (AM), 239.5 (PM)	F (AM), F (PM)
Sackville St. - Queen St.	Northbound	42.7 (AM), 455.2 (PM)	E (AM), F (PM)
Sackville St. - Brunswick St.	Southbound	206.0 (AM), 83.9 (PM)	F (AM), F (PM)
Spring Garden Rd. - Birmingham St.	Northbound, Southbound	AM: NB: 57.6, SB: 64.1 PM: NB: 285.3, SB:248.2	AM: F (NB), F (SB) PM: F (NB), F (SB)
Spring Garden Rd. - Brunswick St.	Southbound	95.2 (AM), 35.2 (PM)	F (AM), E (PM)
Brenton Pl. - South Park St.	Westbound	93.5 (PM)	F (PM)
Clyde St. - Queen St.	Eastbound	35.2 (PM)	E (PM)
Morris St. - Queen St.	Eastbound, Westbound Northbound, Southbound	PM: EB: 62.6, WB: 61.8, NB: 87.8, SB: 41.2	PM: F (EB), F (WB), F (NB), E (SB)

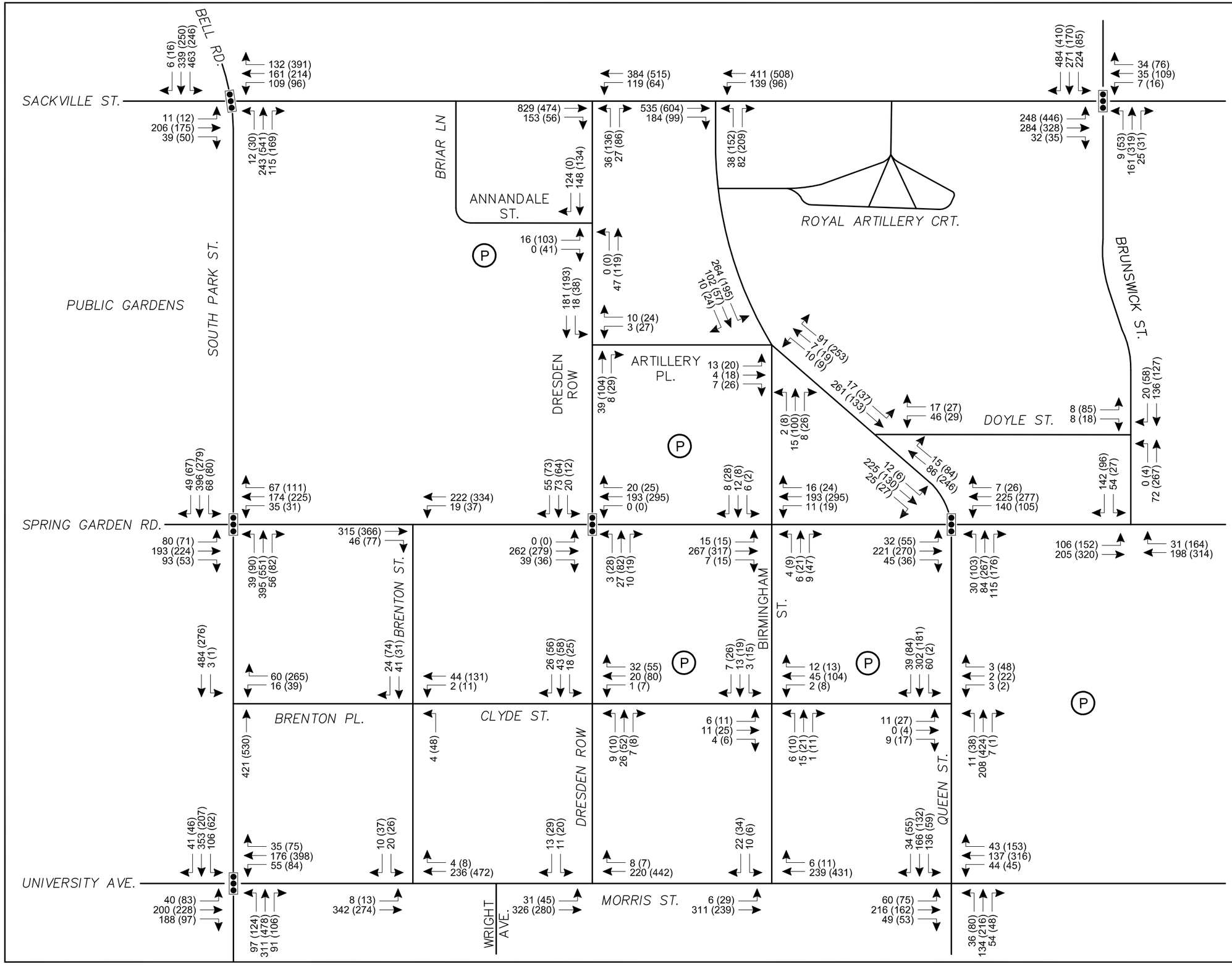
Intersection Type

Signalized	Stop-Controlled

The high delays at the intersections along Spring Garden Road are mainly due to pedestrian conflicts and the actual delay may be less than that predicted in the traffic model due to the driver behaviour of inching forward with a vehicle until pedestrians yield the right of way. The delays in the p.m. period at the intersections along Sackville Street are due to the large volume of traffic on Sackville Street which causes the vehicles on the side streets to wait for long periods of time for an acceptable gap in the traffic. This situation also occurs at the intersection of Brenton Place and South Park Street although the delays are not as significant. The total volume of traffic entering the intersection of Morris Street and Queen Street has reached the capacity of this four-way stop controlled intersection thereby engendering increased delays for all movements. The delay at the intersection of Sackville Street and Brunswick Street is a result of the high volume of southbound traffic. This delay may be able to be reduced by optimizing the signal timing at the intersection

5.1.2 Scenario B

Scenario B incorporates the streetscape design for Spring Garden Road. Sidewalks are widened at the intersections of Brenton Street, Dresden Row and Birmingham Street. This reduces the distance that pedestrians are required to cross by narrowing the roadway at these intersections, which has the effect of eliminating the de facto left turn lane in the eastbound and westbound directions. For this reason, left turns will be prohibited at Dresden Row. In addition, a dedicated left turn lane will be added in the eastbound direction at the intersection of Queen Street and Spring Garden Road. The projected traffic volumes for Scenario B in the year 2020 are shown in **Figure 9**.


SACKVILLE ST.
BELL RD.
SOUTH PARK ST.
PUBLIC GARDENS
BRIAR LN
ANNANDALE ST.
ROYAL ARTILLERY CRT.
BRUNSWICK ST.
DRESDEN ROW
ARTILLERY PL.
DOYLE ST.
SPRING GARDEN RD.
BRENTON ST.
BIRMINGHAM ST.
BRENTON PL.
CLYDE ST.
DRESDEN ROW
QUEEN ST.
UNIVERSITY AVE.
WRIGHT AVE.
MORRIS ST.
6 (16) 339 (250) 463 (246)
132 (391) 161 (214) 109 (96)
11 (12) 206 (175) 39 (50)
12 (30) 243 (541) 115 (169)
829 (474) 153 (56)
384 (515) 119 (64)
535 (604) 184 (99)
411 (508) 139 (96)
36 (136) 27 (86)
38 (152) 82 (209)
124 (0) 148 (134)
484 (410) 271 (170) 224 (85)
34 (76) 35 (109) 7 (16)
248 (446) 284 (328) 32 (35)
9 (53) 161 (319) 25 (31)
16 (103) 0 (41)
0 (0) 47 (119)
181 (193) 18 (38)
10 (24) 3 (27)
264 (195) 102 (51) 10 (24)
91 (253) 7 (19) 10 (9)
39 (104) 8 (29)
13 (20) 4 (18) 7 (26)
17 (37) 261 (133)
17 (27) 46 (29)
2 (8) 15 (100) 8 (26)
8 (85) 8 (18)
20 (58) 136 (127)
49 (67) 396 (279) 68 (80)
67 (111) 174 (225) 35 (31)
222 (334) 19 (37)
55 (73) 73 (64) 20 (12)
20 (25) 193 (295) 0 (0)
8 (28) 12 (8) 6 (2)
16 (24) 193 (295) 11 (19)
12 (6) 225 (130) 25 (27)
15 (84) 86 (246)
7 (26) 225 (277) 140 (105)
142 (96) 54 (27)
0 (4) 72 (267)
80 (71) 193 (224) 93 (53)
39 (90) 395 (551) 56 (82)
315 (366) 46 (77)
0 (0) 262 (279) 39 (36)
3 (28) 27 (82) 10 (19)
15 (15) 267 (317) 7 (15)
4 (9) 6 (21) 9 (47)
32 (55) 221 (270) 45 (36)
30 (103) 84 (267) 115 (176)
106 (152) 205 (320)
31 (164) 198 (314)
484 (276) 3 (1)
60 (265) 16 (39)
24 (74) 41 (31)
44 (131) 2 (11)
26 (56) 43 (58) 18 (25)
32 (55) 20 (80) 1 (7)
7 (26) 13 (19) 3 (15)
12 (13) 45 (104) 2 (8)
39 (84) 302 (181) 60 (2)
3 (48) 2 (22) 3 (2)
421 (530)
4 (48)
9 (10) 26 (52) 7 (8)
6 (11) 11 (25) 4 (6)
6 (10) 15 (21) 1 (11)
11 (27) 0 (4) 9 (17)
11 (38) 208 (424) 7 (1)
41 (46) 353 (207) 106 (62)
35 (75) 176 (398) 55 (84)
10 (37) 20 (26)
4 (8) 236 (472)
13 (29) 11 (20)
8 (7) 220 (442)
22 (34) 10 (6)
6 (11) 239 (431)
34 (55) 166 (132) 136 (59)
43 (153) 137 (316) 44 (45)
40 (83) 200 (228) 188 (97)
97 (124) 311 (478) 91 (106)
8 (13) 342 (274)
31 (45) 326 (280)
6 (29) 311 (239)
60 (75) 216 (162) 49 (53)
36 (80) 134 (216) 54 (48)
NORTH
1 No. DATE BY ISSUES / REVISIONS
LEGEND
Right Turn
Through
Left Turn
50 AM Traffic Volumes
(75) PM Traffic Volumes
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The detailed results of the intersection analysis for Scenario B are presented in **Appendix B**. Intersections exhibiting a poor level of service are summarised in **Table 5.**

Table 5 Scenario B Intersections with Poor LOS

AM period	PM period
Sackville St. - Dresden Row	Sackville St. - Dresden Row
Sackville St. - Queen St.	Sackville St. - Queen St.
Sackville St. - Brunswick St.	Sackville St. - Brunswick St.
Spring Garden Rd. - Birmingham St.	Spring Garden Rd. - Birmingham St.
Spring Garden Rd. - Brunswick St.	Brenton Pl. - South Park St.
	Clyde St. - Queen St.
	Morris St. - Queen St.

Intersection	Problematic movements	Delay (seconds)	LOS
Sackville St. - Dresden Row	Northbound	227.5 (AM), 215.9 (PM)	F (AM), F (PM)
Sackville St. - Queen St.	Northbound	37.9 (AM), 423.5 (PM)	E (AM), F (PM)
Sackville St. - Brunswick St.	Southbound	206.0 (AM), 83.9 (PM)	F (AM), F (PM)
Spring Garden Rd. - Birmingham St.	Northbound, Southbound	AM: NB:62.7, SB: 69.4 PM: NB:100.1, SB: 129.8	AM: F (NB), F (SB) PM: F (NB), F (SB)
Spring Garden Rd. - Brunswick St.	Southbound	94.1 (AM)	F (AM)
Brenton Pl. - South Park St.	Westbound	95.4 (PM)	F (PM)
Clyde St. - Queen St.	Eastbound	36.1 (PM)	E (PM)
Morris St. - Queen St.	Eastbound, Westbound Northbound, Southbound	PM: EB: 62.6, WB: 82.7 NB: 87.8, SB: 41.2	PM: F (EB), F (WB) F (NB), E (SB)

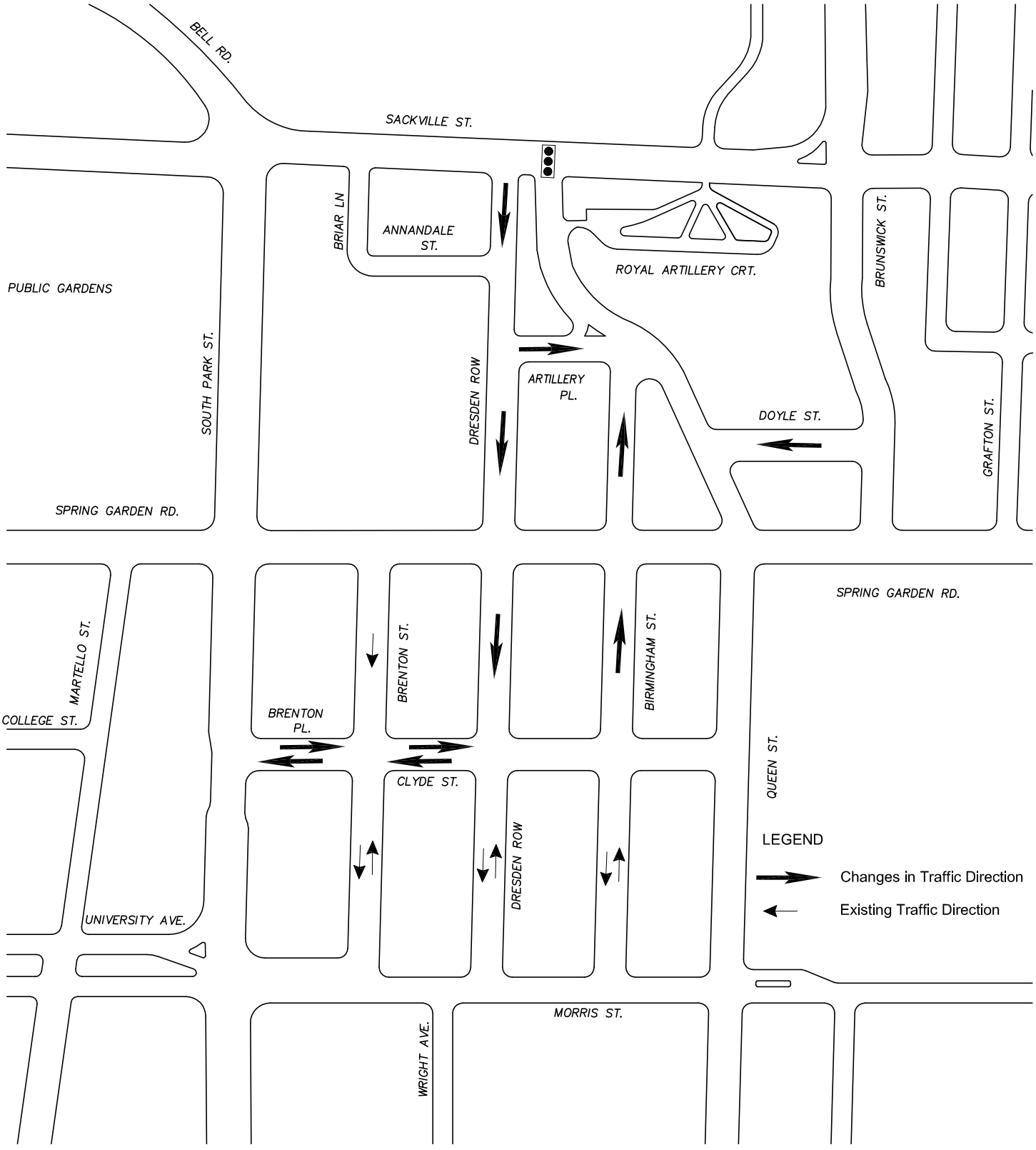
Intersection Type

Signalized	Stop-Controlled

The same intersections that exhibited a poor level of service in Scenario A also have a poor level of service in Scenario B, although there has been an improvement at the intersection of Spring Garden Road and Birmingham Street. The delay at this intersection has decreased due to the narrowing of the roadway which reduces pedestrian crossing times. With the removal of the de facto left turn lane the vehicles waiting on Birmingham Street are more easily able to find gaps in traffic since there is only one lane to cross in both the eastbound and westbound directions.

5.1.3 Scenario C

Scenario C consists of the one-way street system proposed by the Spring Garden Area Business Association, which is shown in **Figure 10**. In this scenario, Dresden Row and Birmingham Street will become one-way streets from Sackville Street to Clyde Street for southbound and northbound traffic respectively. A traffic signal will be added at the intersection of Sackville Street and Queen Street to compensate for the larger volume from redistributed traffic on Queen Street. Doyle Street will become a westbound one-way street and Artillery Place will become one-way in the eastbound direction. Brenton Place and Clyde Street will change from a one-way street to a two-way street between South Park and Dresden Row, therefore allowing continuous two-way traffic between South Park Street and Queen Street. By changing formerly bi-directional streets to one-way streets, more overall space will become available for on-street parking in the Spring Garden area, although there is a loss of parking spaces on Brenton Place and Clyde Street between South Park Street and Dresden Row. Due to the new roadway configuration, numerous turns from the former two lane roads will become prohibited resulting in a new traffic circulation pattern. The figures describing the redistribution of the traffic are presented in **Appendix A**. The volume distribution for this scenario is presented in **Figure 11.**



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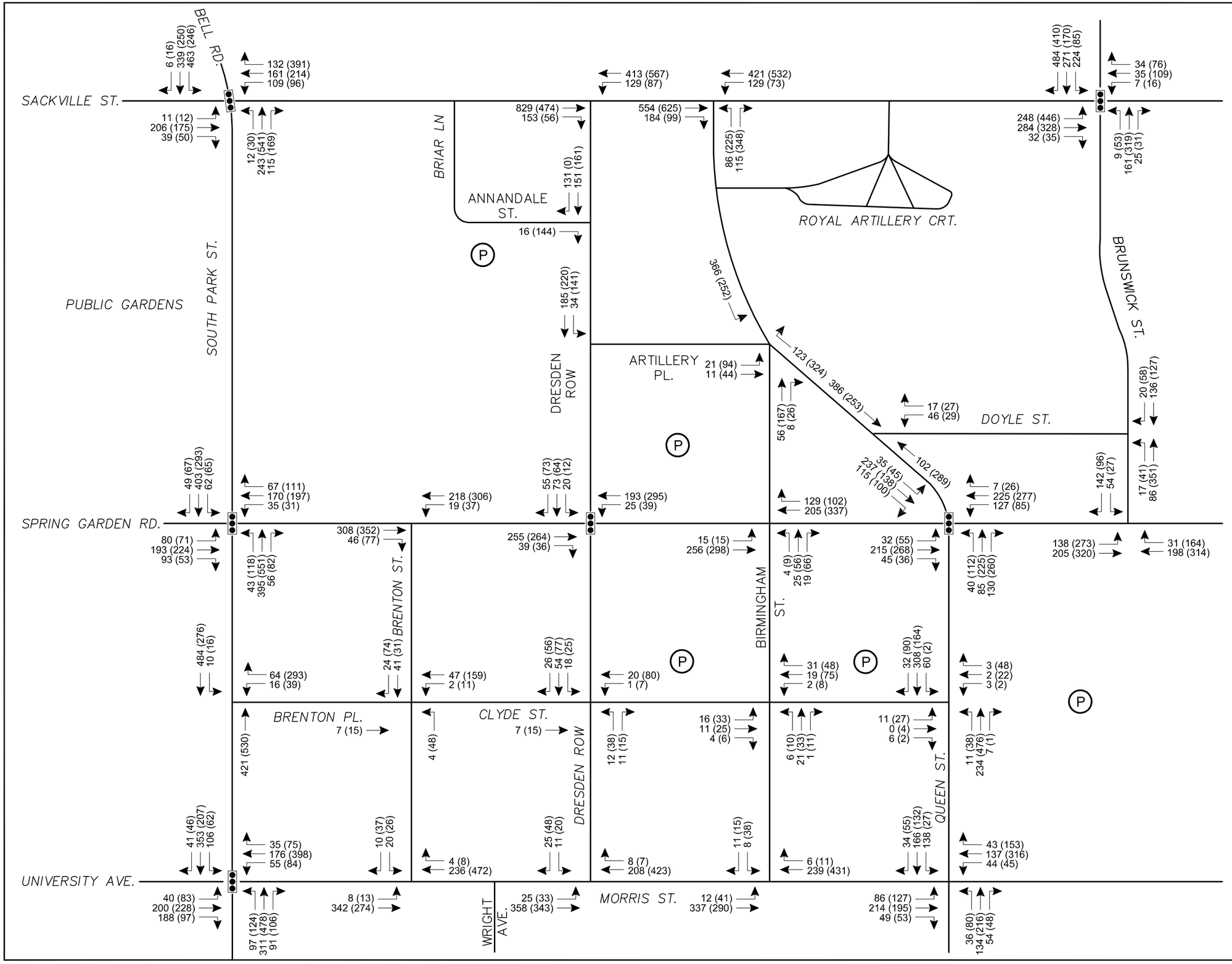
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LEGEND

Right Turn
Through
Left Turn

50 AM Traffic Volumes

(75) PM Traffic Volumes

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An increase in traffic volumes in comparison to Scenario A was observed at the following intersections:

- Queen/Sackville
- Artillery/Birmingham/Queen
- Queen/Spring Garden
- Spring Garden/ Brunswick
- Queen/Morris

Due to the redistribution patterns, Queen Street is likely to experience an increase in traffic volumes. Also, the conversion of Doyle Street to a one-way street will likely increase the traffic volumes at the Spring Garden Road/ Brunswick Street intersection as traffic is redistributed along Spring Garden Road in order to reach Brunswick Street.

The conversion of Brenton Place from a one-way street to a two-way street is unlikely to attract much traffic volume and would also require the removal of on-street parking. Since it is not a through street, drivers likely have Clyde Street as a destination or are searching for parking if they are driving on this street. In order to access Clyde Street, southbound vehicles on South Park Street would need to make a left turn at the unsignalised intersection of Brenton Place and South Park Street; however, this movement requires a gap in traffic flow which may be difficult to find due to the high volume of northbound traffic. Northbound vehicles on South Park Street could be more likely to use the newly created two-way street but Clyde Street is easily accessible from any of the intersections along Morris Street and there is no obvious need for the redistribution of eastbound traffic flow along Brenton Place.

The detailed results of the intersection analysis for Scenario C are presented in **Appendix B**. Intersections exhibiting a poor level of service are summarised in **Table 6.**

Table 6 Scenario C Intersections with Poor LOS

AM period	PM period
Sackville St. - Brunswick St.	Sackville St. - Brunswick St.
Spring Garden Rd. - Birmingham St.	Spring Garden Rd. - Birmingham St.
Spring Garden Rd. - Brunswick St.	Spring Garden Rd. - Brunswick St.
	Brenton Pl. - South Park St.
	Clyde St. - Queen St.
	Morris St. - Queen St.

Intersection	Problematic movements	Delay (seconds)	LOS
Sackville St. - Brunswick St.	Southbound	206.0 (AM), 83.9 (PM)	F (AM), F (PM)
Spring Garden Rd. - Birmingham St.	Northbound	42.2 (AM), 312.1 (PM)	E (AM), F (PM)
Spring Garden Rd. - Brunswick St.	Southbound	123.5 (AM), 63.2 (PM)	F (AM), F (PM)
Brenton Pl. - South Park St.	Westbound	240.1 (PM)	F (PM)
Clyde St. - Queen St.	Eastbound	49.6 (PM)	E (PM)
Morris St. - Queen St.	Eastbound, Westbound Northbound	PM: EB:132.3, WB:58.4, NB:81.0	PM: F (EB), F (WB), F (NB)

Intersection Type

Signalized	Stop-Controlled

In Scenario C, the intersections at Sackville Street/ Queen Street and Sackville Street/ Dresden Row no longer experience poor levels of service related to delay because the one-way configuration of Dresden Row and the installation of traffic signals at Queen Street alleviate the congestion problems. Although more traffic has been redirected to Queen Street in this scenario, the addition of the traffic signal at Sackville Street manages the increase in traffic volumes.

The increase in traffic on Queen Street does, however, have a negative impact at the intersections with Clyde Street and with Morris Street. The intersections of Spring Garden Road with Birmingham Street and Brunswick Street continue to be problematic, as does the intersection of Brenton Place and South Park Street. The delay at Brenton Place increases significantly due to the loss of a turning bay when the street is converted into a two-way street. Drivers are currently making use of the full width of the roadway to create a left turn lane and a right turn lane. Once the street becomes two-way, the opportunity for drivers to create an extra turn lane at the intersection would be lost.

5.1.4 Scenario D

Scenario D combines the modifications described in Scenarios B and C. This option will encompass the streetscape design for Spring Garden Road and the proposed one-way street system. The volume distribution for this scenario is presented in **Figure 12.**

The detailed results of the intersection analysis for Scenario D are presented in **Appendix B**. Intersections exhibiting a poor level of service are summarised in **Table 7.**

Table 7 Scenario D Intersections with Poor LOS

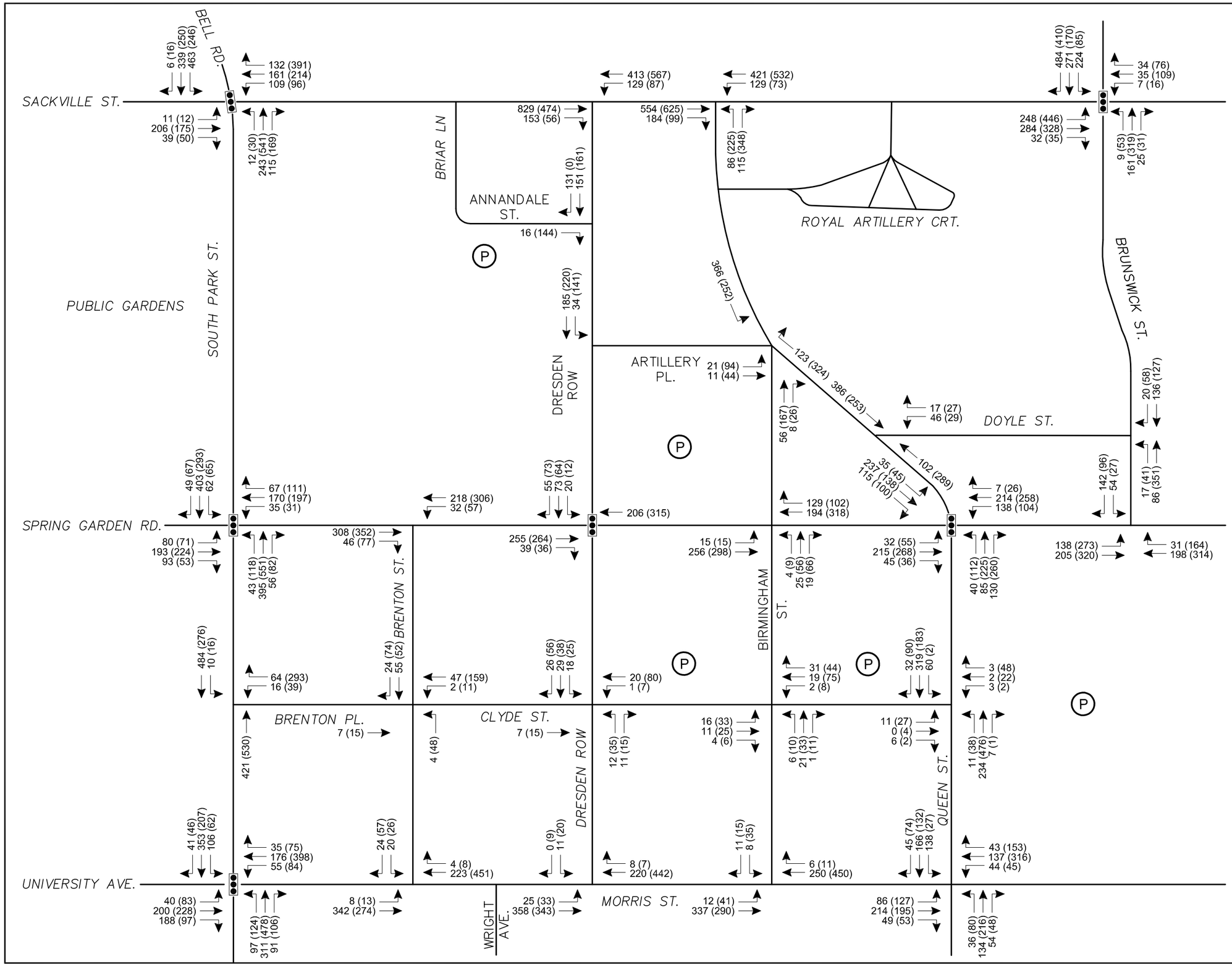
AM period	PM period
Sackville St. - Brunswick St.	Sackville St. - Brunswick St.
Spring Garden Rd. - Birmingham St.	Spring Garden Rd. - Birmingham St.
Spring Garden Rd. - Brunswick St.	Spring Garden Rd. - Brunswick St.
	Brenton Pl. - South Park St.
	Clyde St. - Queen St.
	Morris St. - Queen St.

Intersection	Problematic movements	Delay (seconds)	LOS
Sackville St. - Brunswick St.	Southbound	206.0 (AM), 83.9 (PM)	F (AM), F (PM)
Spring Garden Rd. - Birmingham St.	Northbound	36.5 (AM), 157.7 (PM)	E (AM), F (PM)
Spring Garden Rd. - Brunswick St.	Southbound	123.5 (AM), 65.8 (PM)	F (AM), F (PM)
Brenton Pl. - South Park St.	Westbound	234.5 (PM)	F (PM)
Clyde St. - Queen St.	Eastbound	52.0 (PM)	F (PM)
Morris St. - Queen St.	Eastbound, Westbound Northbound, Southbound	PM: EB:139.9, WB: 61.3 NB: 86.4, SB: 35.2	PM: F (EB), F (WB) F (NB), E (SB)

Intersection Type

Signalized	Stop-Controlled

The intersections with poor levels of service in Scenario D are the same intersections as in Scenario C since the traffic flow patterns are very similar.



No.	DATE	BY	ISSUES / REVISIONS
1			

LEGEND

Right Turn
Through
Left Turn

50 AM Traffic Volumes

(75) PM Traffic Volumes

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CLIENT:

HALIFAX
REGIONAL MUNICIPALITY

PROJECT:

Halifax Regional Municipality
Transportation Study
Spring Garden Road Area

DRAWING:

HORIZON YEAR 2020
SCENARIO D

DRAWN BY:	CHECKED BY:	PROJECT No. :
S.A.E.		60144708
DESIGNED BY:	APPROVED BY:	DRAWING No.
		Fig. 12
SCALE:	DATE:	
N.T.S.	Feb. 2010	

ID - C:\Projects\60431601144708 Spring Garden Road\CAD\Drawings\60144708_Fig 12_Horizon Year Scenario D.dwg - Thu, 1 Apr 2010 - 11:18

5.2 Future Scenarios with Background Growth and Development

Once the development traffic was added to the projected background traffic volumes for 2020, another operational analysis was performed on the intersections in the study area. The intersection of Artillery Place and Birmingham Street was analysed using SimTraffic rather than Synchro due to the unusual configuration of the intersection. Several other intersections had analysis issues using the Synchro software including Spring Garden Road at Brunswick Street and at Birmingham Street. The pedestrian volumes are very high at these intersections and the model is not able to accurately model high pedestrian volumes at stop-controlled intersections. Therefore, SimTraffic was used for the analysis of Spring Garden Road and Birmingham Street which gave a more realistic model of the actual traffic situation based on discussion with HRM. The other intersections were analysed with Synchro software under the assumption that modifications would eventually be applied to the scenarios in order to improve the operations.

5.2.1 Scenario A

The existing road layout and traffic control system is considered Scenario A. The projected traffic volumes including development traffic for Scenario A in the year 2020 are shown in **Figure 13**. The detailed results of the intersection analysis for Scenario A are presented in **Appendix B**. Intersections exhibiting a poor level of service are summarised in **Table 8.**

Table 8 Intersections with Poor LOS - Scenario A with Development

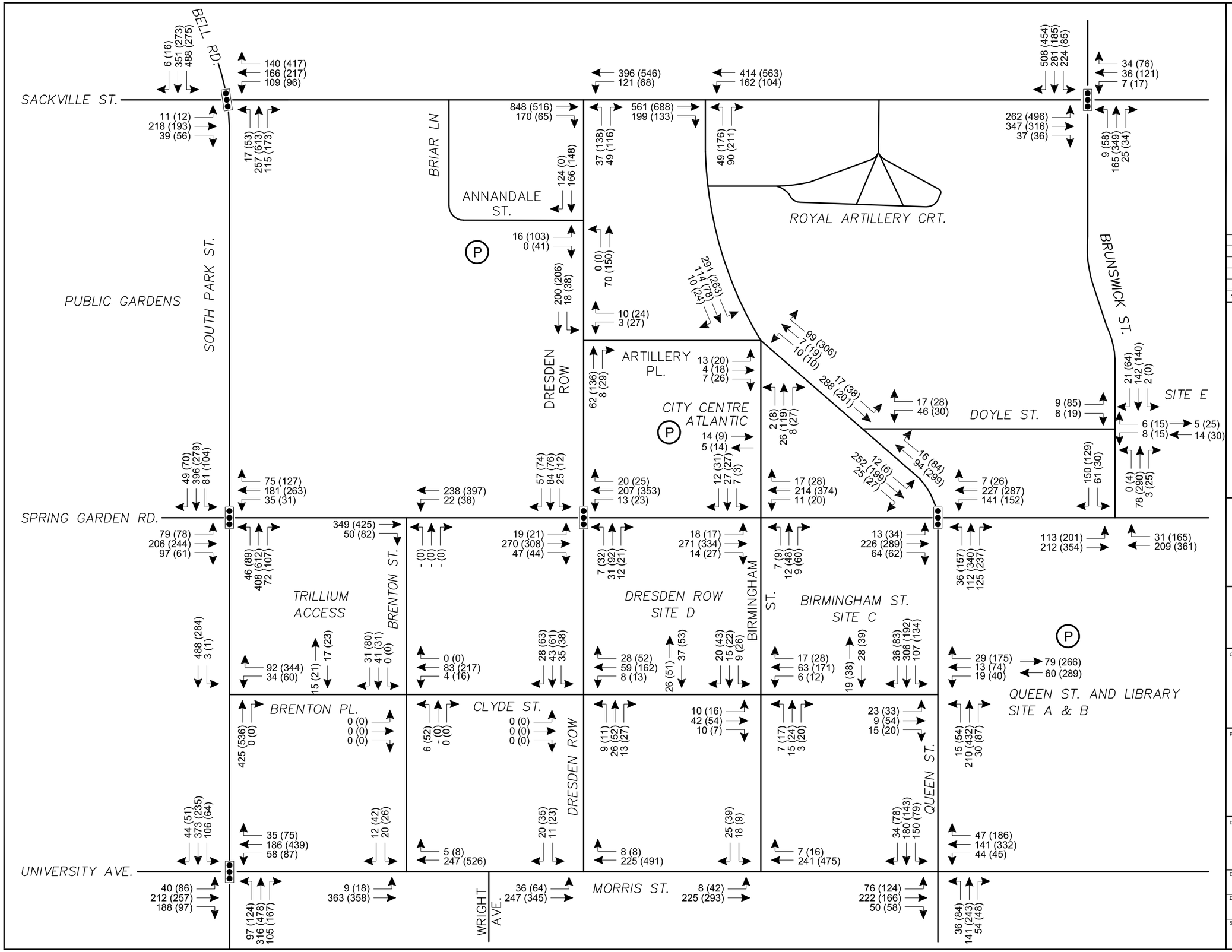
AM period	PM period
Sackville St. – Dresden Row	Sackville St. – Dresden Row
Sackville St. – Queen St.	Sackville St. – Queen St.
Sackville St. - Brunswick St.	Sackville St. - Brunswick St.
Spring Garden Rd. - Brunswick St.	Spring Garden Rd. - Birmingham St.
Clyde St. – Queen St.	Spring Garden Rd. - Queen St.
	Spring Garden Rd. - Brunswick St.
	Brenton Pl. - South Park St.
	Clyde St. - Queen St.
	Morris St. - Queen St.

Intersection	Problematic movements	Delay (seconds)	LOS
Sackville St. – Dresden Row	Northbound	376.6 (AM), 383.6 (PM)	F (AM), F (PM)
Sackville St. – Queen St.	Northbound	70.0 (AM), 800.0 (PM)	F (AM), F (PM)
Sackville St. - Brunswick St.	Eastbound, Southbound	AM: SB:69.0 PM: EB: 58.1, SB: 99.0	AM: E (SB) PM: E (EB), F (SB)
Spring Garden Rd. - Birmingham St.	Northbound	38.8 (PM)	E (PM)
Spring Garden Rd. - Queen St.	Northbound	55.1 (PM)	E (PM)
Spring Garden Rd. - Brunswick St.	Southbound	134.2 (AM), 861.0 (PM)	F (AM), F (PM)
Brenton Pl. - South Park St.	Westbound	196.0 (PM)	F (PM)
Clyde St. - Queen St.	Eastbound, Westbound	AM: EB: 44.2, WB: 37.8 PM: EB: 800.0, WB: 800.0	AM: E (EB), E (WB) PM: F (EB), F (WB)
Morris St. - Queen St.	Eastbound, Westbound Northbound, Southbound	PM: EB:139.1, WB: 83.2 NB: 148.8, SB: 77.9	PM: F (EB), F (WB) F (NB), F (SB)

Intersection Type

Signalized	Stop-Controlled

Some reduction in delay is indicated at the Sackville St. and Brunswick St. intersection as compared to the Scenario A analysis without development traffic due to an optimization of the signal timing of the phases, although the cycle length remained constant. Other intersections had a definite degradation in operating conditions due the additional traffic volumes from the developments.



NORTH

No.	DATE	BY	ISSUES / REVISIONS
1			

LEGEND

- Right Turn
- Through
- Left Turn
- 50 AM Traffic Volumes
- (75) PM Traffic Volumes

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CLIENT:

HALIFAX REGIONAL MUNICIPALITY

PROJECT:

Halifax Regional Municipality
Transportation Study
Spring Garden Road Area

DRAWING:

TOTAL 2020 VOLUMES
INCLUDING DEVELOMENT
TRAFFIC - SCENARIO A

DRAWN BY:	CHECKED BY:	PROJECT No. :
S.A.E.		60144708
DESIGNED BY:	APPROVED BY:	DRAWING No.
		Fig. 13
SCALE:	DATE:	
N.T.S.	Mar. 2010	

C:\PROJECTS\60\60144708 SPRING GARDEN ROAD\CAD\DRAWINGS\60144708_FIG 13_TOTAL_2020_VOLUMES SCENARIO A.DWG

5.2.2 Scenario B

Scenario B incorporates the streetscape design for Spring Garden Road. The projected traffic volumes including development traffic for Scenario B in the year 2020 are shown in **Figure 14**. The detailed results of the intersection analysis for Scenario B are presented in **Appendix B** and intersections exhibiting a poor level of service are summarised in **Table 9.**

Table 9 Intersections with Poor LOS - Scenario B with Development

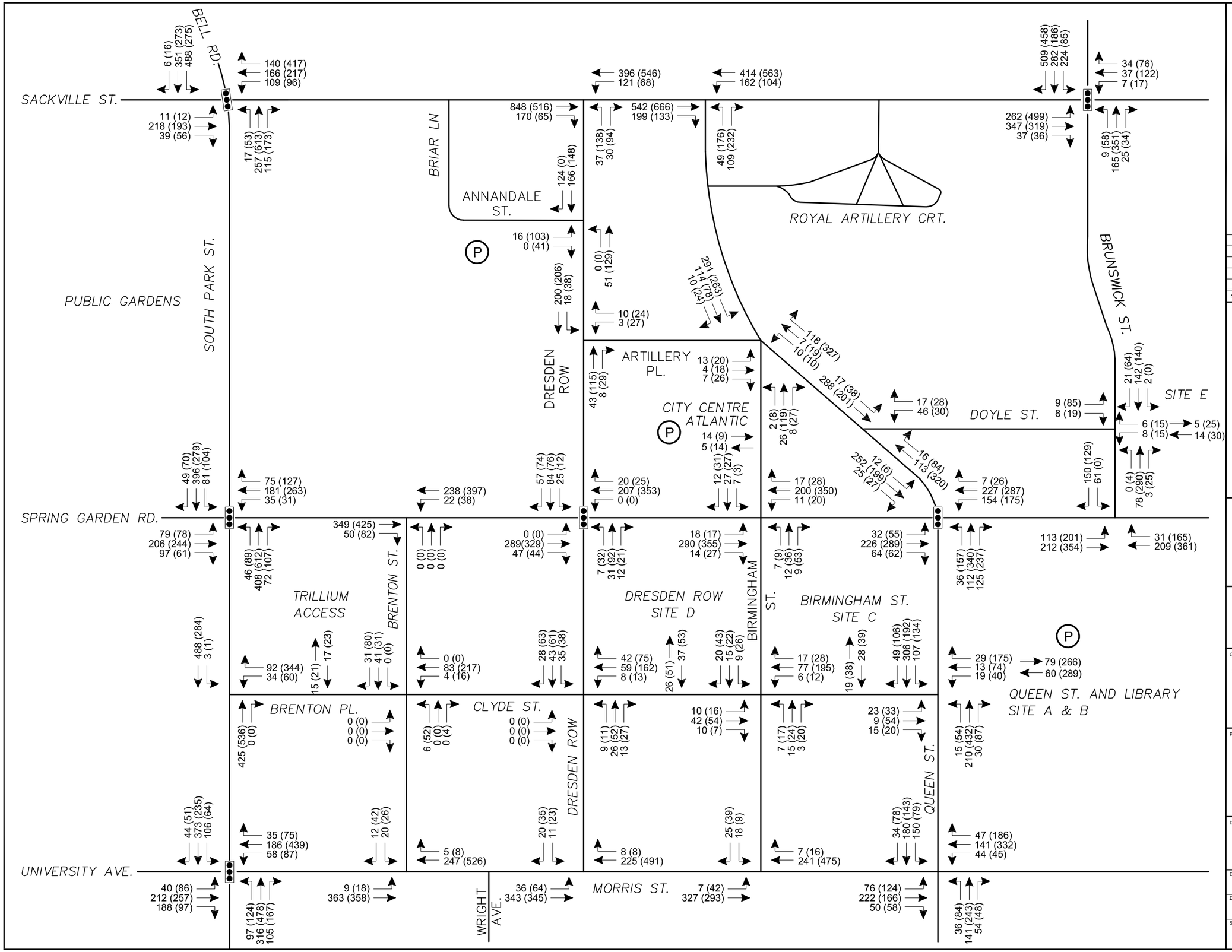
AM period	PM period
Sackville St. – Dresden Row	Sackville St. – Dresden Row
Sackville St. – Queen St.	Sackville St. – Queen St.
Sackville St. - Brunswick St.	Sackville St. - Brunswick St.
Spring Garden Rd. - Brunswick St.	Spring Garden Rd. - Birmingham St.
Clyde St. – Queen St.	Spring Garden Rd. - Queen St.
	Spring Garden Rd. - Brunswick St.
	Brenton Pl. - South Park St.
	Clyde St. - Queen St.
	Morris St. - Queen St.

Intersection	Problematic movements	Delay (seconds)	LOS
Sackville St. – Dresden Row	Northbound	340.3 (AM), 354.8 (PM)	F (AM), F (PM)
Sackville St. – Queen St.	Northbound	61.8 (AM), 800.0 (PM)	F (AM), F (PM)
Sackville St. - Brunswick St.	Eastbound, Southbound	AM: SB:69.0 PM: EB: 58.1, SB: 99.0	AM: E (SB) PM: E (EB), F (SB)
Spring Garden Rd. - Birmingham St.	Northbound	68.8 (PM)	F (PM)
Spring Garden Rd. - Queen St.	Northbound	55.1 (PM)	E (PM)
Spring Garden Rd. - Brunswick St.	Southbound	134.2 (AM), 806.6 (PM)	F (AM), F (PM)
Brenton Pl. - South Park St.	Westbound	196.0 (PM)	F (PM)
Clyde St. - Queen St.	Eastbound, Westbound	AM: EB: 45.0, WB: 38.4 PM: EB: 800.0, WB: 800.0	AM: E (EB), E (WB) PM: F (EB), F (WB)
Morris St. - Queen St.	Eastbound, Westbound Northbound, Southbound	PM: EB:139.1, WB: 83.2, NB: 148.8, SB: 77.9	PM: F (EB), F (WB), F (NB), F (SB)

Intersection Type

Signalized	Stop-Controlled

The same intersections that exhibited a poor level of service in Scenario A also have a poor level of service in Scenario B with very similar delays. The intersections of Birmingham Street at Spring Garden Road and Brenton Place at South Park Street indicate delays that are not representative of the expected situation. The traffic at these two-way stop controlled intersections will experience gaps created by the traffic signals at the adjacent intersections. The gaps will allow traffic to more easily flow through the intersection.



No.	DATE	BY	ISSUES / REVISIONS
1			

LEGEND

Right Turn
Through
Left Turn

50 AM Traffic Volumes
(75) PM Traffic Volumes

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CLIENT: HALIFAX REGIONAL MUNICIPALITY

PROJECT:

Halifax Regional Municipality
Transportation Study
Spring Garden Road Area

DRAWING:

TOTAL 2020 VOLUMES
INCLUDING DEVELOMENT
TRAFFIC - SCENARIO B

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S.A.E.		60144708
DESIGNED BY:	APPROVED BY:	DRAWING No.
		Fig. 14
SCALE:	DATE:	
N.T.S.	Mar. 2010	

C:\PROJECTS\4043\60144708 SPRING GARDEN ROAD\CAD\DRAWINGS\60144708_FIG 13_TOTAL_2020_VOLUMES SCENARIO B.DWG

5.2.3 Scenario C

Scenario C consists of the proposed one-way cross street system. The projected traffic volumes including development traffic for Scenario C in the year 2020 are shown in **Figure 15**. The detailed results of the intersection analysis for Scenario C are presented in **Appendix B** and intersections exhibiting a poor level of service are summarised in **Table 10.**

Table 10 Intersections with Poor LOS - Scenario C with Development

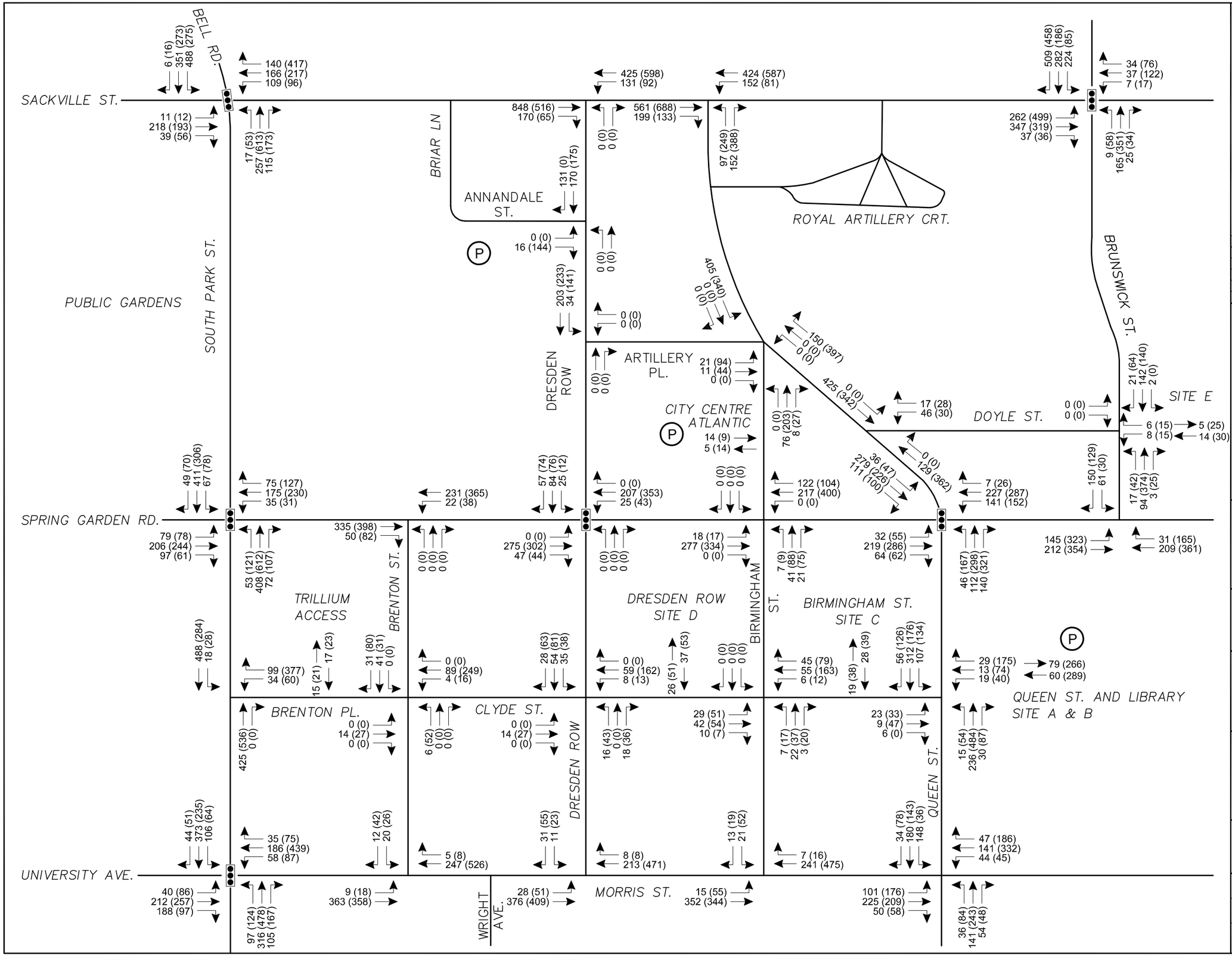
AM period	PM period
Sackville St. - Brunswick St.	Sackville St. - Brunswick St.
Spring Garden Rd. - Brunswick St.	Artillery Pl. - Birmingham St.
Clyde St. – Queen St.	Spring Garden Rd. – Birmingham St.
	Spring Garden Rd. - Queen St.
	Spring Garden Rd. - Brunswick St.
	Brenton Pl. - South Park St.
	Clyde St. - Queen St.
	Morris St. - Queen St.

Intersection	Problematic movements	Delay (seconds)	LOS
Sackville St. - Brunswick St.	Eastbound, Southbound	AM: SB:69.0 PM: EB: 58.1, SB: 99.0	AM: E (SB) PM: E (EB), F (SB)
Artillery Pl. - Birmingham St.	Eastbound, Northbound	PM: EB: 35.2, NB: 66.2	PM: E (EB), F (NB)
Spring Garden Rd. - Birmingham St.	Northbound	77.8 (PM)	F (PM)
Spring Garden Rd. - Queen St.	Northbound, Southbound	PM: NB:102.5, SB: 256.9	PM: F (NB), F (SB)
Spring Garden Rd. - Brunswick St.	Eastbound, Southbound	AM: 177.5 (SB) PM: 40.1 (EB), 800.0 (SB)	AM: F (SB) PM: E (EB), F (SB)
Brenton Pl. - South Park St.	Westbound	470.2 (PM)	F (PM)
Clyde St. - Queen St.	Eastbound, Westbound	AM: EB:48.5, WB: 35.3 PM: EB: 800.0, WB: 800.0	AM: E (EB), E (WB) PM: F (EB), F (WB)
Morris St. - Queen St.	Eastbound, Westbound Northbound, Southbound	PM: EB:240.6, WB: 72.8, NB: 126.4, SB: 44.3	PM: F (EB), F (WB), F (NB), E (SB)

Intersection Type

Signalized	Stop-Controlled

In Scenario C, the intersections at Sackville Street no longer experience poor levels of service related to delay because the one-way configuration of Dresden Row and the installation of traffic signals at Queen Street alleviate the congestion problems. However, the eastbound queue at the traffic lights could extend through the intersection of Sackville Street and Dresden Row. The additional southbound traffic, which turns left at the Queen Street and Spring Garden Road intersection due to the one-way configuration of Doyle Street, increases the delay for all the southbound traffic because there is a single southbound lane. The overall increase in traffic on Queen Street has a negative impact at the intersections with Clyde Street and with Morris Street where the stop-controlled intersections fail. The intersection of Queen Street with Artillery Place and Birmingham Street also experiences an increase in delay. The intersections of Spring Garden Road with Birmingham Street and Brunswick Street continue to be problematic, as does the intersection of Brenton Place and South Park Street. The delay at Brenton Place increases significantly due to the loss of a turning bay when the street is converted into a two-way street. Drivers are currently making use of the full width of the roadway to create a left turn lane and a right turn lane. Once the street becomes two-way, the opportunity for drivers to create an extra turn lane at the intersection is lost.


SACKVILLE ST.
BELL RD.
6 (16)
351 (273)
488 (275)
140 (417)
166 (217)
109 (96)
11 (12)
218 (193)
39 (56)
17 (53)
257 (613)
115 (173)
425 (598)
131 (92)
424 (587)
152 (81)
848 (516)
170 (65)
561 (688)
199 (133)
0 (0)
0 (0)
97 (249)
152 (388)
509 (458)
282 (186)
224 (85)
34 (76)
37 (122)
7 (17)
262 (499)
347 (319)
37 (36)
9 (58)
165 (351)
25 (34)
BRIAR LN
ANNANDALE ST.
131 (0)
170 (175)
ROYAL ARTILLERY CRT.
PUBLIC GARDENS
SOUTH PARK ST.
0 (0)
16 (144)
0 (0)
0 (0)
203 (233)
34 (141)
0 (0)
0 (0)
405 (340)
0 (0)
0 (0)
BRUNSWICK ST.
DRESDEN ROW
ARTILLERY PL.
21 (94)
11 (44)
0 (0)
0 (0)
0 (0)
150 (397)
0 (0)
0 (0)
425 (342)
0 (0)
17 (28)
46 (30)
CITY CENTRE ATLANTIC
14 (9)
5 (14)
0 (0)
76 (203)
8 (27)
DOYLE ST.
0 (0)
0 (0)
21 (64)
142 (140)
2 (0)
SITE E
6 (15)
8 (15)
5 (25)
14 (30)
17 (42)
94 (374)
3 (25)
49 (70)
411 (306)
67 (78)
75 (127)
175 (230)
35 (31)
231 (365)
22 (38)
57 (74)
84 (76)
25 (12)
0 (0)
207 (353)
25 (43)
0 (0)
0 (0)
0 (0)
122 (104)
217 (400)
0 (0)
36 (47)
279 (226)
111 (100)
0 (0)
129 (362)
7 (26)
227 (287)
141 (152)
150 (129)
61 (30)
SPRING GARDEN RD.
79 (78)
206 (244)
97 (61)
53 (121)
408 (612)
72 (107)
335 (398)
50 (82)
0 (0)
275 (302)
47 (44)
0 (0)
0 (0)
0 (0)
18 (17)
277 (334)
0 (0)
7 (9)
41 (88)
21 (75)
32 (55)
219 (286)
64 (62)
46 (167)
112 (298)
140 (321)
145 (323)
212 (354)
31 (165)
209 (361)
TRILLIUM ACCESS
BRENTON ST.
DRESDEN ROW SITE D
BIRMINGHAM ST.
BIRMINGHAM ST. SITE C
QUEEN ST. AND LIBRARY SITE A & B
488 (284)
18 (28)
99 (377)
34 (60)
15 (21)
17 (23)
31 (80)
41 (31)
0 (0)
0 (0)
89 (249)
4 (16)
28 (63)
54 (81)
35 (38)
0 (0)
59 (162)
8 (13)
26 (51)
37 (53)
0 (0)
0 (0)
0 (0)
45 (79)
55 (163)
6 (12)
19 (38)
28 (39)
56 (126)
312 (176)
107 (134)
29 (175)
13 (74)
19 (40)
79 (266)
60 (289)
BRENTON PL.
CLYDE ST.
DRESDEN ROW
QUEEN ST.
425 (536)
0 (0)
0 (0)
14 (27)
0 (0)
6 (52)
0 (0)
0 (0)
0 (0)
14 (27)
0 (0)
16 (43)
0 (0)
18 (36)
29 (51)
42 (54)
10 (7)
7 (17)
22 (37)
3 (20)
23 (33)
9 (47)
6 (0)
15 (54)
236 (484)
30 (87)
44 (51)
373 (235)
106 (64)
35 (75)
186 (439)
58 (87)
12 (42)
20 (26)
5 (8)
247 (526)
31 (55)
11 (23)
8 (8)
213 (471)
13 (19)
21 (52)
7 (16)
241 (475)
34 (78)
180 (143)
148 (36)
47 (186)
141 (332)
44 (45)
UNIVERSITY AVE.
40 (86)
212 (257)
188 (97)
97 (124)
316 (478)
105 (167)
9 (18)
363 (358)
WRIGHT AVE.
28 (51)
376 (409)
MORRIS ST.
15 (55)
352 (344)
101 (176)
225 (209)
50 (58)
36 (84)
141 (243)
54 (48)
NORTH
No. DATE BY ISSUES / REVISIONS
1
LEGEND
Right Turn
Through
Left Turn
50 AM Traffic Volumes
(75) PM Traffic Volumes
AECOM
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PROJECT:
Halifax Regional Municipality
Transportation Study
Spring Garden Road Area
DRAWING:
TOTAL 2020 VOLUMES
INCLUDING DEVELOMENT
TRAFFIC - SCENARIO C
DRAWN BY: S.A.E.
CHECKED BY:
PROJECT No.: 60144708
DESIGNED BY:
APPROVED BY:
DRAWING No.
Fig. 15
SCALE: N.T.S.
DATE: Mar. 2010
C:\PROJECTS\60\436\60144708 SPRING GARDEN ROAD\CAD\DRAWINGS\60144708_FIG 13_TOTAL_2020_VOLUMES SCENARIO C.DWG

5.2.4 Scenario D

Scenario D is a combination of the modifications described in Scenarios B and C. This option encompasses both the streetscape design for Spring Garden Road and the proposed one-way street system. The projected traffic volumes including development traffic for Scenario C in the year 2020 are presented in **Figure 16.** The detailed results of the intersection analysis for Scenario D are presented in **Appendix B**. Intersections exhibiting a poor level of service are summarised in **Table 11.**

Table 11 Intersections with Poor LOS - Scenario D with Development

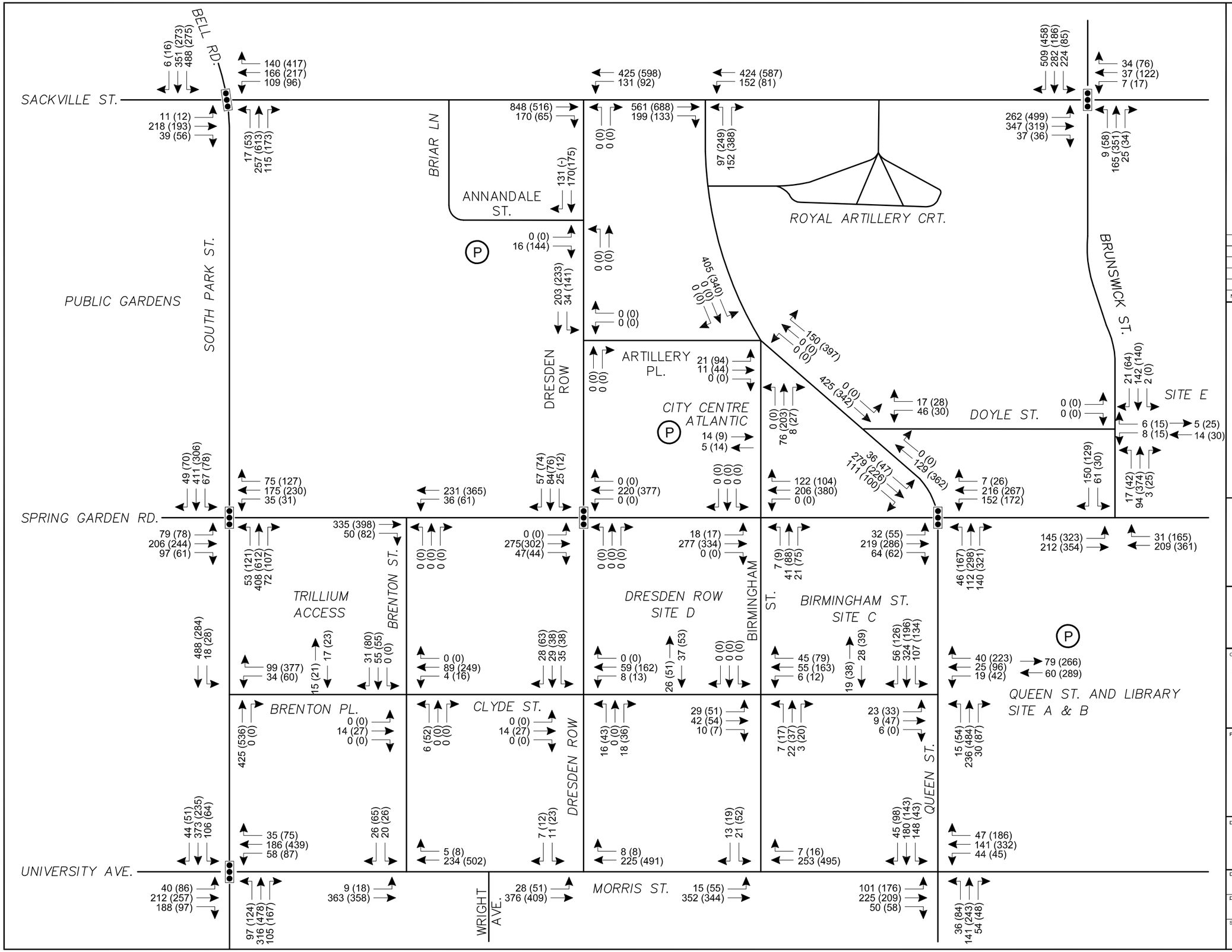
AM period	PM period
Sackville St. - Brunswick St.	Sackville St. - Brunswick St.
Spring Garden Rd. - Brunswick St.	Artillery Pl. - Birmingham St.
Clyde St. – Queen St.	Spring Garden Rd. – Birmingham St.
	Spring Garden Rd. - Queen St.
	Spring Garden Rd. - Brunswick St.
	Brenton Pl. - South Park St.
	Clyde St. - Queen St.
	Morris St. - Queen St.

Intersection	Problematic movements	Delay (seconds)	LOS
Sackville St. - Brunswick St.	Eastbound, Southbound	AM: SB:69.0 PM: EB: 58.1, SB: 99.0	AM: E (SB) PM: E (EB), F (SB)
Artillery Pl. - Birmingham St.	Eastbound, Northbound	PM: EB: 36.3, NB: 102.9	PM: E (EB), F (NB)
Spring Garden Rd. - Birmingham St.	Northbound	55.5 (PM)	F (PM)
Spring Garden Rd. - Queen St.	Northbound, Southbound	PM: NB:128.0, SB: 468.7	PM: F (NB), F (SB)
Spring Garden Rd. - Brunswick St.	Southbound	177.5 (AM), 800.0 (PM)	F (AM), F (PM)
Brenton Pl. - South Park St.	Westbound	470.2 (PM)	F (PM)
Clyde St. - Queen St.	Eastbound, Westbound	AM: EB:39.6 PM: EB: 800.0, WB: 800.0	AM: E (EB) PM: F (EB), F (WB)
Morris St. - Queen St.	Eastbound, Westbound Northbound, Southbound	PM: EB:256.1, WB: 78.0, NB: 137.7, SB: 58.1	PM: F (EB), F (WB), F (NB), F (SB)

Intersection Type

Signalized	Stop-Controlled

The intersections with poor levels of service in Scenario D are the same intersections as in Scenario C since the traffic flow patterns are very similar, although the conditions at the intersections of Queen Street at Spring Garden Road and at Artillery Place and Birmingham Street further deteriorate due to an increase in traffic volumes on Queen Street caused by the prohibition of left turns at Dresden Row.



No.	DATE	BY	ISSUES / REVISIONS
1			

LEGEND

- Right Turn
- Through
- Left Turn
- 50 AM Traffic Volumes
- (75) PM Traffic Volumes

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CLIENT:

HALIFAX REGIONAL MUNICIPALITY

PROJECT:

Halifax Regional Municipality
Transportation Study
Spring Garden Road Area

DRAWING:

TOTAL 2020 VOLUMES
INCLUDING DEVELOMENT
TRAFFIC - SCENARIO D

DRAWN BY:	CHECKED BY:	PROJECT No. :
S.A.E.		60144708
DESIGNED BY:	APPROVED BY:	DRAWING No.
		Fig. 16
SCALE:	DATE:	
N.T.S.	Mar. 2010	

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5.3 Summary of Impacts

The three roadway layout Scenarios B through D generate impacts related to intersection operations as well as impacts to access and traffic flow. The impacts to intersection operations can be measured through quantitative methods and the differences between the scenarios can be easily compared. Impacts related to access and traffic flow are mostly qualitative and should be considered separately for each scenario.

5.3.1 Intersection operations

In order to compare the intersection operations of the four roadway scenarios, tables were prepared that present the delay for each intersection using vehicle-hours of delay for the scenarios that include the background traffic growth (**Table 12**) and for the scenarios that include background traffic growth and development traffic (**Table 13**). This measure of delay takes into account the volumes at each approach to the intersection and the delay experienced at each approach.

Table 12 Comparative Intersection Analysis in Vehicle-Hours of Delay 2020 Scenarios with Background Traffic Growth

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Sackville St. - South Park St.	12.00	12.00	10.90	11.19	13.24	13.24	11.64	14.77
Sackville St. - Dresden Row	6.38	4.65	0.75	0.75	16.47	13.61	0.42	0.42
Sackville St. - Queen St.	1.76	1.81	5.70	5.85	43.44	42.93	12.20	11.00
Sackville St. - Brunswick St.	59.76	59.76	59.76	59.76	27.28	27.28	27.28	27.28
Artillery Pl. - Dresden Row	0.08	0.08	0.08	0.08	0.31	0.29	0.36	0.36
Artillery Pl. - Birmingham St.	0.51	1.02	0.46	0.47	0.89	0.81	1.43	1.31
Doyle St. - Queen St.	0.25	0.25	0.22	0.22	0.33	0.34	0.21	0.21
Doyle St. - Brunswick St.	0.04	0.04	0.04	0.04	0.46	0.46	0.13	0.13
Spring Garden Rd. - South Park St.	7.61	7.62	7.55	7.70	10.15	10.09	9.82	11.59
Spring Garden Rd. - Brenton St.	0.06	0.06	0.05	0.09	0.23	0.23	0.12	0.33
Spring Garden Rd. - Dresden Row	2.40	2.43	2.09	1.92	3.96	4.01	3.01	2.64
Spring Garden Rd. - Birmingham St.	0.86	0.92	0.62	0.56	8.88	3.81	11.41	5.83
Spring Garden Rd. - Queen St.	5.08	5.26	7.83	7.72	7.81	8.20	11.81	11.71
Spring Garden Rd. - Brunswick St.	5.52	5.46	7.19	7.19	2.36	1.84	4.11	4.04
Brenton Pl. - South Park St.	0.37	0.37	0.48	0.48	7.91	7.91	22.25	21.73
Clyde St. - Brenton St.	0.14	0.14	0.18	0.18	0.62	0.62	0.82	0.84
Clyde St. - Dresden Row	0.17	0.21	0.15	0.15	0.52	0.59	0.54	0.50
Clyde St. - Birmingham St.	0.21	0.25	0.24	0.24	0.57	0.66	0.67	0.67
Clyde St. - Queen St.	0.37	0.37	0.36	0.37	0.62	0.63	0.61	0.65
Morris St. - South Park St.	6.94	6.94	6.92	7.07	9.72	9.73	9.70	9.51
Morris St. - Brenton St.	0.15	0.15	0.15	0.19	0.35	0.35	0.35	0.44
Morris St. - Dresden Row	0.18	0.18	0.21	0.13	0.39	0.39	0.45	0.27
Morris St. - Birmingham St.	0.14	0.14	0.12	0.13	0.27	0.28	0.50	0.50
Morris St. - Queen St.	5.43	5.43	6.33	6.23	25.07	25.07	38.79	41.43
Total Vehicle Hours of Delay	116.42	115.56	118.40	118.72	181.86	173.36	168.65	168.16

Legend

Signalized Intersection
Stop-Controlled Intersection
A and B - Stop-Controlled Intersection C and D - Signalized Intersection

Table 13 Comparative Intersection Analysis in Vehicle-Hours of Delay
2020 Scenarios with Background Traffic Growth and Development Traffic

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Sackville St. - South Park St.	13.89	13.90	13.18	13.18	20.15	20.12	19.06	19.03
Sackville St. - Dresden Row	9.79	7.12	0.86	0.86	27.42	23.22	0.50	0.50
Sackville St. - Queen St.	3.42	3.42	6.18	6.17	86.48	91.13	14.29	14.36
Sackville St. - Brunswick St.	25.42	25.42	25.42	25.42	40.19	40.19	40.19	40.19
Artillery Pl. - Dresden Row	0.08	0.08	0.08	0.08	0.31	0.30	0.36	0.36
Artillery Pl. - Birmingham St.	0.44	0.45	0.38	0.54	1.34	1.38	6.39	8.86
Doyle St. - Queen St.	0.26	0.26	0.24	0.24	0.39	0.40	0.25	0.25
Doyle St. - Brunswick St.	0.05	0.05	0.04	0.04	0.48	0.54	0.14	0.14
Spring Garden Rd. - South Park St.	8.37	8.37	8.22	8.22	14.30	16.23	13.04	12.80
Spring Garden Rd. - Brenton St.	0.07	0.07	0.06	0.10	0.30	0.30	0.14	0.44
Spring Garden Rd. - Dresden Row	2.78	2.81	2.40	2.36	4.55	4.59	3.32	3.43
Spring Garden Rd. - Birmingham St.	0.57	0.55	0.65	0.84	2.39	4.07	4.81	4.17
Spring Garden Rd. - Queen St.	6.01	6.32	8.17	8.45	17.30	18.62	53.76	81.23
Spring Garden Rd. - Brunswick St.	8.24	8.24	10.91	10.91	39.75	37.35	42.87	42.87
Brenton Pl. - South Park St.	0.69	0.69	1.06	1.07	22.00	22.00	57.19	57.26
Clyde St. - Brenton St.	0.28	0.28	0.36	0.36	1.15	1.15	1.36	1.59
Clyde St. - Dresden Row	0.40	0.44	0.40	0.39	1.21	1.35	1.24	1.16
Clyde St. - Birmingham St.	0.48	0.53	0.56	0.57	1.41	1.61	1.58	1.58
Clyde St. - Queen St.	1.68	1.70	1.57	1.38	88.83	88.85	83.80	82.93
Morris St. - South Park St.	7.44	7.62	7.40	7.60	11.53	11.64	11.51	11.50
Morris St. - Brenton St.	0.16	0.16	0.16	0.20	0.45	0.45	0.45	0.57
Morris St. - Dresden Row	0.22	0.22	0.24	0.16	0.33	0.59	0.67	0.44
Morris St. - Birmingham St.	0.19	0.19	0.21	0.21	0.40	0.40	0.86	0.89
Morris St. - Queen St.	7.00	7.00	7.89	8.28	48.45	48.45	57.32	56.21
Total Vehicle Hours of Delay	97.92	95.87	96.64	97.62	431.11	434.95	415.10	442.77

Legend

Signalized Intersection
Stop-Controlled Intersection
A and B - Stop-Controlled Intersection C and D - Signalized Intersection

Scenarios with Background Traffic Growth

Many of the intersections exhibited relatively stable results with little change in delay between the existing situation, Scenario A, and the other three scenarios. These consistent results are mainly along Clyde Street and Morris Street with the exception of the intersection of Morris Street and Queen Street where a deterioration of conditions was observed in both the a.m. and p.m. peak periods but with a more pronounced change in the p.m. peak hour. This intersection is expected to have too much traffic in the future for a four-way stop and signals should be considered for the future. Other intersections with fairly stable delays are Sackville Street/ South Park Street, Sackville Street/ Brunswick Street, Spring Garden Road/ South Park Street and Artillery Place/ Dresden Row.

At the intersection of Sackville Street and Dresden Row there were improved results in Scenarios C and D due to the removal of the northbound traffic flows. In the one-way street Scenarios of C and D, traffic on Dresden Row is southbound only, thereby reducing overall delays at the intersection.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Sackville St. - Dresden Row	6.38	4.65	0.75	0.75	16.47	13.61	0.42	0.42

At the intersection of Sackville Street and Queen Street there is an increase in delay in the a.m. period in Scenarios C and D due to the installation of a traffic signal, but in p.m. period for the same scenarios there is a reduction in delay due to better overall flow of traffic.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Sackville St. - Queen St.	1.76	1.81	5.70	5.85	43.44	42.93	12.20	11.00

The intersection of Artillery Place and Birmingham Street experiences greater delay for northbound vehicles in Scenarios C and D in the p.m. period due to the increase in traffic volumes from redistributed traffic.

Intersection	PM Scenarios			
	A	B	C	D
Artillery Pl. - Birmingham St.	0.89	0.81	1.43	1.31

There is an improvement in delay at the intersection of Doyle Street and Queen Street due to the elimination of the southbound left turn movements, although the improvement is fairly minimal.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Doyle St. - Queen St.	0.25	0.25	0.22	0.22	0.33	0.34	0.21	0.21

At the intersection of Doyle Street and Brunswick Street there is reduced delay in Scenarios C and D due to the change in roadway configuration and the elimination of traffic volumes eastbound on Doyle Street.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Doyle St. - Brunswick St.	0.04	0.04	0.04	0.04	0.46	0.46	0.13	0.13

Although the delays at the intersection of Spring Garden Road and Brenton Street vary from the different scenarios the total delay and the change in delay is minimal.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Spring Garden Rd. - Brenton St..	0.06	0.06	0.05	0.09	0.23	0.23	0.12	0.33

At the intersection of Spring Garden Road and Dresden Row the results improved in Scenarios C and D due to the elimination of northbound traffic.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Spring Garden Rd. - Dresden Row	2.40	2.43	2.09	1.92	3.96	4.01	3.01	2.64

At the intersection of Spring Garden Road and Birmingham Street each scenario had different results. In Scenario A, it was observed that the de facto left turn lane reduces gap time for traffic travelling in the northbound and southbound directions. When this lane is removed in Scenario B, the delay for the northbound and southbound traffic is reduced since there is only one lane for the traffic to cross. In Scenario C the delay was higher in the p.m. period since there were again two lanes to cross on Spring Garden Road for the northbound traffic. Also, the total intersection traffic volumes were higher than in Scenario B or Scenario D. In Scenario D there was more northbound traffic at this intersection than in Scenario B due to traffic shifting from Dresden Row.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Spring Garden Rd. - Birmingham St.	0.86	0.92	0.62	0.56	8.88	3.81	11.41	5.83

At the intersection of Spring Garden Road and Queen Street the delays are increased for Scenarios C and D since the traffic volumes are higher which therefore increases the overall vehicle-hours of delay.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Spring Garden Rd. - Queen St.	5.08	5.26	7.83	7.72	7.81	8.20	11.81	11.71

At the intersection of Spring Garden Road and Brunswick Street there is a significant increase in the delay for southbound traffic in Scenarios C and D due to large amount of additional eastbound traffic turning left that has been detoured from the intersection of Queen Street and Doyle Street. The a.m. scenarios produce higher delays due to the higher southbound traffic flows. There are also a large number of pedestrians which impede the southbound traffic flow.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Spring Garden Rd. - Brunswick St.	5.52	5.46	7.19	7.19	2.36	1.84	4.11	4.04

The intersection of Brenton Place and South Park Street is at capacity in the p.m. peak period and any additional vehicles westbound on Brenton Place increase the delay significantly. The effect of the increase of traffic vehicles may be mitigated somewhat through the natural rebalancing of traffic volumes as people select different routes through the Spring Garden area to avoid delay.

Intersection	PM Scenarios			
	A	B	C	D
Brenton Pl. - South Park St.	7.91	7.91	22.25	21.73

The total overall delay for the scenarios with background traffic growth is shown at the bottom of Table 12 and repeated here.

	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Total Vehicle Hours of Delay	116.42	115.56	118.40	118.72	181.86	173.36	168.65	168.16

From this table, we can see that the scenarios in the a.m. period have similar amounts of delay but in the p.m. period, Scenario D has the least amount of overall delay. This is due to the reduction in delay at the Sackville Street and Dresden Row and Sackville Street and Queen Street intersections even though the delay at other intersections increases.

Scenarios with Background Traffic Growth and Development Traffic

Once the development traffic was added to the road network, every intersection experienced an increase in delay. However, the results shown for the intersection of Sackville Street and Brunswick Street indicate a reduced overall delay in the a.m. because the traffic signal timing was optimized at this intersection for the a.m. period. Many of the intersections exhibited comparative results that were similar to the results from the scenarios with the background traffic growth only. For example, intersections that operated with less delay in Scenario C with traffic volumes based on background traffic growth also had less delay when the development traffic was included.

A few intersections experienced a severe degradation in intersection operations due to the increased traffic from developments.

Without traffic signals in Scenarios A and B, the intersection of Sackville Street and Queen Street completely fails during the p.m. peak period. Once traffic signals are installed, as suggested for Scenarios C and D, the intersection is able to handle the traffic volumes predicted.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Background Traffic								
Sackville St. - Queen St.	1.76	1.81	5.70	5.85	43.44	42.93	12.20	11.00
Background and Development Traffic								
Sackville St. - Queen St.	3.42	3.42	6.18	6.17	86.48	91.13	14.29	14.36

The increased traffic flow along Spring Garden Road further impedes the ability of southbound traffic on Brunswick Street to find a gap in the eastbound and westbound traffic in order to proceed.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Background Traffic								
Spring Garden Rd. - Brunswick St.	5.52	5.46	7.19	7.19	2.36	1.84	4.11	4.04
Background and Development Traffic								
Spring Garden Rd. - Brunswick St.	8.24	8.24	10.91	10.91	39.75	37.35	42.87	42.87

The proposed developments produce an increase of traffic on Queen Street, which then has a large impact on the intersections along Queen Street. The stop-controlled intersections at Clyde Street and at Morris Street are unable to handle the increase in traffic and the intersection at Spring Garden Road also needs modifications.

Intersection	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Background Traffic								
Spring Garden Rd. - Queen St.	5.08	5.26	7.83	7.72	7.81	8.20	11.81	11.71
Clyde St. - Queen St.	0.37	0.37	0.36	0.37	0.62	0.63	0.61	0.65
Morris St. - Queen St.	5.43	5.43	6.33	6.23	25.07	25.07	38.79	41.43
Background and Development Traffic								
Spring Garden Rd. - Queen St.	6.01	6.32	8.17	8.45	17.30	18.62	53.76	81.23
Clyde St. - Queen St.	1.68	1.70	1.57	1.38	88.83	88.85	83.80	82.93
Morris St. - Queen St.	7.00	7.00	7.89	8.28	48.45	48.45	57.32	56.21

The total overall delay for the scenarios with background traffic growth is shown at the bottom of Table 13 and repeated here.

	AM Scenarios				PM Scenarios			
	A	B	C	D	A	B	C	D
Total Vehicle Hours of Delay	97.92	95.87	96.64	97.62	431.11	434.95	415.10	442.77

From this table, we can see that the scenarios in the a.m. period have similar amounts of delay but in the p.m. period, Scenario C has the least amount of overall delay, although the total delay is high for all scenarios.

5.3.2 Access and Traffic Flow

In addition to the operational impacts observed at the intersections, each of the scenarios produced impacts related to access and the flow of traffic.

Scenario B

Due to the prohibition of left turns at Dresden Row and Spring Garden Road, there are fewer turning movement conflicts at this intersection. Also, the traffic volumes are likely to detour to Queen Street, which allows the main traffic flow to remain on the major roads. However, a more circuitous route is required to reach the new developments on Dresden Row and Birmingham Street and there is a reduction in pass-by traffic on Dresden Row with a projected reduction of approximately 20 vehicles in the a.m. and p.m. peak hours.

At Queen Street, where a dedicated eastbound left turn lane is to be added, there is a possibility of implementing a left turn phase in the signal timing. There is also an opportunity for allowing opposing left turn movements if the east side of the intersection is rehabilitated at the same time. This shift in lane arrangements would allow westbound through traffic to align with the driving lane instead of the parking lane west of the intersection.

The narrowing of Spring Garden Road at Birmingham and at Dresden Row allows one lane for all movements in the eastbound and westbound directions. There is therefore less distance for pedestrians to cross and less potential conflict for the northbound and southbound traffic. The crossing decision for these vehicles is made easier since there are fewer lanes to observe.

Scenario C

The one-way southbound designation for Dresden Row will improve the flow of traffic at the Sackville Street and Dresden Row intersection and reduce the number of conflicting turning movements at this intersection. Southbound traffic will continue to have easy access to the Annandale Street parking garage entrance but traffic coming from Spring Garden Road requires a circuitous route to this parking garage. The pass-by traffic on Dresden Row is reduced by approximately 65 vehicles in the a.m. peak hour and by 155 vehicles in the p.m. peak hour. The extra road width achieved by the reduction of Dresden Row to a single lane road could be used for approximately 20 additional on-street parking spaces between Spring Garden Road and Sackville Street.

The one-way northbound designation of Birmingham Street will impact vehicles attempting to access the parking garage entrance on Birmingham Street. Good access to this parking garage is maintained for vehicles coming from Spring Garden Road, but vehicles coming from Sackville Street must detour onto Spring Garden Road in order to gain access to parking garage. The Queen Street/ Artillery Place/ Birmingham Street intersection could experience increased northbound traffic at Birmingham Street. Vehicles departing from the parking garage will only have the northbound option and additional vehicles could be redistributed from Dresden Row. Five additional on-street parking spaces would become available on Birmingham Street between Spring Garden Road and Artillery Place due to the increase in available pavement width.

With Doyle Street as one-way westbound, there will be a reduction in conflicts at Queen Street and Doyle Street due to the elimination of southbound left turning traffic crossing Queen Street. This traffic of 17 vehicles in the a.m. peak hour and 37 vehicles in the p.m. peak hour will be rerouted through the intersection of Brunswick Street and Spring Garden Road.

Due to Artillery Place becoming a one-way eastbound roadway, the Queen Street/ Artillery Place/ Birmingham Street intersection could experience additional traffic volumes entering the intersection from Artillery Place since this road is a viable routing option for vehicles exiting the parking garage on Annandale Street and intending to access Sackville Street. The narrow roadway is appropriate width for one-way traffic. The roads meet awkward angles at the intersection of Queen Street/ Artillery Place/ Birmingham Street which makes for difficult sightlines for the northbound traffic on Birmingham Street and the left turning eastbound traffic on Artillery Place. The change to one-way streets for both Artillery Place and Birmingham Street eliminates the Queen Street northbound left turns and Queen Street southbound right turns to Artillery Place or southbound through traffic to Birmingham Street. These eliminated movements reduce some potential for conflict at this intersection.

With Brenton Place and Clyde Street becoming a two-way street between South Park Street and Dresden Row, traffic from South Park Street can use this roadway to travel in an eastbound direction, however the roadway is somewhat narrow for two-way traffic. On street parking that currently uses the north side of Brenton Place would need to be restricted if this section of roadway is converted to two way traffic. Also, westbound vehicles at the intersection of South Park Street and Brenton Place will no longer be able to use the full width of the pavement for separate left and right turning lanes if bi-directional traffic is introduced.

The signalization of the Queen Street and Sackville Street intersection will improve the traffic flow at this busy intersection especially as traffic increases due to the redistribution of traffic from Dresden Row.

Scenario D

Scenario D is expected to experience a combination of effects from both Scenario B and Scenario C. The same access issues and traffic flow issues as described for Scenario B and C will also occur in Scenario D.

5.4 Modifications

Several modifications to the proposed Scenarios C and D were considered in order to improve the intersection operations in the study area. Modifications that were carried forward were incorporated into the Synchro model. The intersection operations were evaluated and then compared to the original scenarios.

The concept of a roundabout at the intersection of Morris Street and Queen Street was considered. A single-lane roundabout is not recommended at this intersection based on the proximity of the existing buildings. A standard sized roundabout would be too large for the space available due to the constraints from the buildings on the diagonally opposite corners. Because the projected volumes appear to be fine for roundabout operations, it was decided to model the intersection as a mini-roundabout. A centre island diameter of 7.5m and an inscribed circle diameter of 18.3m was used for the geometry as it appears that these dimensions would fit in the existing road geometry. However, operationally, the mini-roundabout failed with the projected p.m. traffic volumes. Typically, the mini-roundabout is valid for keeping traffic flowing through an intersection but is not good for intersections which require high capacity.

Mini-roundabouts were also considered for the intersections along Clyde Street between Birmingham Street and Brenton Street. These intersections are expected to have relatively low traffic volumes, although the new developments along Clyde Street and on Queen Street near Clyde Street are expected to increase the eastbound traffic volumes. Mini-roundabouts should be able to adequately control traffic operations at these intersections and will also contribute to traffic calming, although they are not intended specifically as traffic calming measures.

An alternate option for the Clyde Street corridor is the installation of stop signs for the north/ south streets that intersect with Clyde Street (Birmingham Street, Dresden Row and Brenton Street) and the removal of stop signs for Clyde Street thereby creating two-way stop controlled intersections. With the conversion of Dresden Row and Birmingham Street to one-way streets north of Clyde Street, the major street becomes Clyde Street, which should be given the right-of-way at two-way stop controlled intersections.

Other modifications that were considered were:

- the installation of traffic signals at the Queen Street and Morris Street intersection
- the installation of traffic signals at the Queen Street and Clyde Street intersection
- an adjustment of the lane arrangement at the intersection of Queen Street and Spring Garden Road to allow for opposing eastbound and westbound left lanes
- the extension of the northbound right turn-through bay at the intersection of Queen Street and Spring Garden Road from 30m to 60m
- the optimization of traffic signal timing
- the removal of parking on Brunswick Street in order to extend right turn lane from the intersection of Brunswick Street and Spring Garden Road to Doyle Street (loss of approximately six parking spots)
- return to one-way operation of Brenton Place and the subsequent utilization of the entire width of the roadway for two westbound turn lanes at the Brenton Place/ South Park Street intersection as well as the retention of existing parking
- return to two-way operation on Doyle Street
- return to one-way operation of Clyde Street between Brenton Street and Dresden Row

The prohibition of the left turn movement from Brenton Place to South Park Street was investigated as a possible method of reducing delay at this intersection. However, the intersection operations did not change significantly so this improvement was not carried forward. The mini-roundabouts were also not carried forward to the model. All other modifications were incorporated into the Synchro model for the analysis of Scenarios C and D. The comparative analysis is shown in **Table 14**.

Table 14 Scenario Analysis with Modifications

AM Scenarios						
Intersection	**A**	**B**	**C**	**C with modifications**	**D**	**D with modifications**
Sackville St. - South Park St.	13.89	13.90	13.18	14.73	13.18	14.73
Sackville St. - Dresden Row	9.79	7.12	0.86	0.71	0.86	0.71
Sackville St. - Queen St.	3.42	3.42	6.18	6.12	6.17	5.65
Sackville St. - Brunswick St.	25.42	25.42	25.42	16.37	25.42	16.37
Artillery Pl. - Dresden Row	0.08	0.08	0.08	0.08	0.08	0.08
Artillery Pl. - Birmingham St.	0.44	0.45	0.38	0.49	0.54	3.28
Doyle St. - Queen St.	0.26	0.26	0.24	0.29	0.24	0.29
Doyle St. - Brunswick St.	0.05	0.05	0.04	0.05	0.04	0.05
Spring Garden Rd. - South Park St.	8.37	8.37	8.22	8.21	8.22	8.39
Spring Garden Rd. - Brenton St.	0.07	0.07	0.06	0.06	0.10	0.10
Spring Garden Rd. - Dresden Row	2.78	2.81	2.40	2.50	2.36	2.57
Spring Garden Rd. - Birmingham St.	0.57	0.55	0.65	0.79	0.84	0.69
Spring Garden Rd. - Queen St.	6.01	6.32	8.17	6.98	8.45	8.02
Spring Garden Rd. - Brunswick St.	8.24	8.24	10.91	2.48	10.91	2.48
Brenton Pl. - South Park St.	0.69	0.69	1.06	0.64	1.07	0.64
Clyde St. - Brenton St.	0.28	0.28	0.36	0.25	0.36	0.30
Clyde St. - Dresden Row	0.40	0.44	0.40	0.47	0.39	0.38
Clyde St. - Birmingham St.	0.48	0.53	0.56	0.14	0.57	0.15
Clyde St. - Queen St.	1.68	1.70	1.57	2.72	1.38	2.26
Morris St. - South Park St.	7.44	7.62	7.40	7.35	7.60	7.63
Morris St. - Brenton St.	0.16	0.16	0.16	0.16	0.20	0.20
Morris St. - Dresden Row	0.22	0.22	0.24	0.24	0.16	0.16
Morris St. - Birmingham St.	0.19	0.19	0.21	0.21	0.21	0.15
Morris St. - Queen St.	7.00	7.00	7.89	5.37	8.28	5.34
Total Vehicle Hours of Delay	97.92	95.87	96.64	77.42	97.62	80.63

Legend

Signalized Intersection
Stop-Controlled Intersection
A and B - Stop-Controlled Intersection C and D - Signalized Intersection
A to D - Stop-Controlled Intersection C and D with modifications - Signals

PM Scenarios						
Intersection	**A**	**B**	**C**	**C with modifications**	**D**	**D with modifications**
Sackville St. - South Park St.	20.15	20.12	19.06	20.21	19.03	20.19
Sackville St. - Dresden Row	27.42	23.22	0.50	0.46	0.50	0.46
Sackville St. - Queen St.	86.48	91.13	14.29	13.39	14.36	13.37
Sackville St. - South Park St.	40.19	40.19	40.19	27.35	40.19	27.35
Artillery Pl. - Dresden Row	0.31	0.30	0.36	0.36	0.36	0.36
Artillery Pl. - Birmingham St.	1.34	1.38	6.39	3.41	8.86	4.49
Doyle St. - Queen St.	0.39	0.40	0.25	0.41	0.25	0.41
Doyle St. - Brunswick St.	0.48	0.54	0.14	0.51	0.14	0.51
Spring Garden Rd. - South Park St.	14.30	16.23	13.04	13.58	12.80	13.42
Spring Garden Rd. - Brenton St.	0.30	0.30	0.14	0.15	0.44	0.43
Spring Garden Rd. - Dresden Row	4.55	4.59	3.32	3.86	3.43	3.97
Spring Garden Rd. - Birmingham St.	2.39	4.07	4.81	2.96	4.17	6.15
Spring Garden Rd. - Queen St.	17.30	18.62	53.76	17.03	81.23	15.87
Spring Garden Rd. - Brunswick St.	39.75	37.35	42.87	6.73	42.87	1.06
Brenton Pl. - South Park St.	22.00	22.00	57.19	19.77	57.26	19.77
Clyde St. - Brenton St.	1.15	1.15	1.36	0.73	1.59	0.87
Clyde St. - Dresden Row	1.21	1.35	1.24	1.08	1.16	0.83
Clyde St. - Birmingham St.	1.41	1.61	1.58	0.37	1.58	0.46
Clyde St. - Queen St.	88.83	88.85	83.80	8.77	82.93	9.09
Morris St. - South Park St.	11.53	11.64	11.51	11.55	11.50	11.55
Morris St. - Brenton St.	0.45	0.45	0.45	0.46	0.57	0.57
Morris St. - Dresden Row	0.33	0.59	0.67	0.73	0.44	0.45
Morris St. - Birmingham St.	0.40	0.40	0.86	0.90	0.89	0.94
Morris St. - Queen St.	48.45	48.45	57.32	14.81	56.21	15.48
Total Vehicle Hours of Delay	431.11	434.95	415.12	169.58	442.77	168.06

Legend

Signalized Intersection
Stop-Controlled Intersection
A and B - Stop-Controlled Intersection C and D - Signalized Intersection
A to D - Stop-Controlled Intersection C and D with modifications - Signals

The modifications included in Scenarios C and D contributed to the reduction of the total delay for the intersections in the study area. In some instances there were minor increases in delay at a particular intersection but overall the modifications improved

the traffic operations. In the p.m. peak period the modifications succeeded in reducing delay to the same level as experienced in the background traffic growth scenarios. In the a.m. peak period, the total delay for the modified scenarios was less than the delay experienced in the background traffic growth scenarios.

6. Recommendations

Based on the results of the operational analyses and taking into account the impacts on access and traffic flow through the road network, the following recommendations are made for the Spring Garden Road Area.

Scenario D, which includes the one-way street layout and the Spring Garden Road streetscape design, can be implemented and will produce acceptable traffic operations results. The narrowing of Spring Garden Road at Birmingham and at Dresden Row allows one lane for all movements in the eastbound and westbound directions. There is therefore less distance for pedestrians to cross and less potential conflict for the northbound and southbound traffic. The crossing decision for these vehicles is made easier since there are fewer lanes to observe. Several modifications to the scenario are proposed as outlined below.

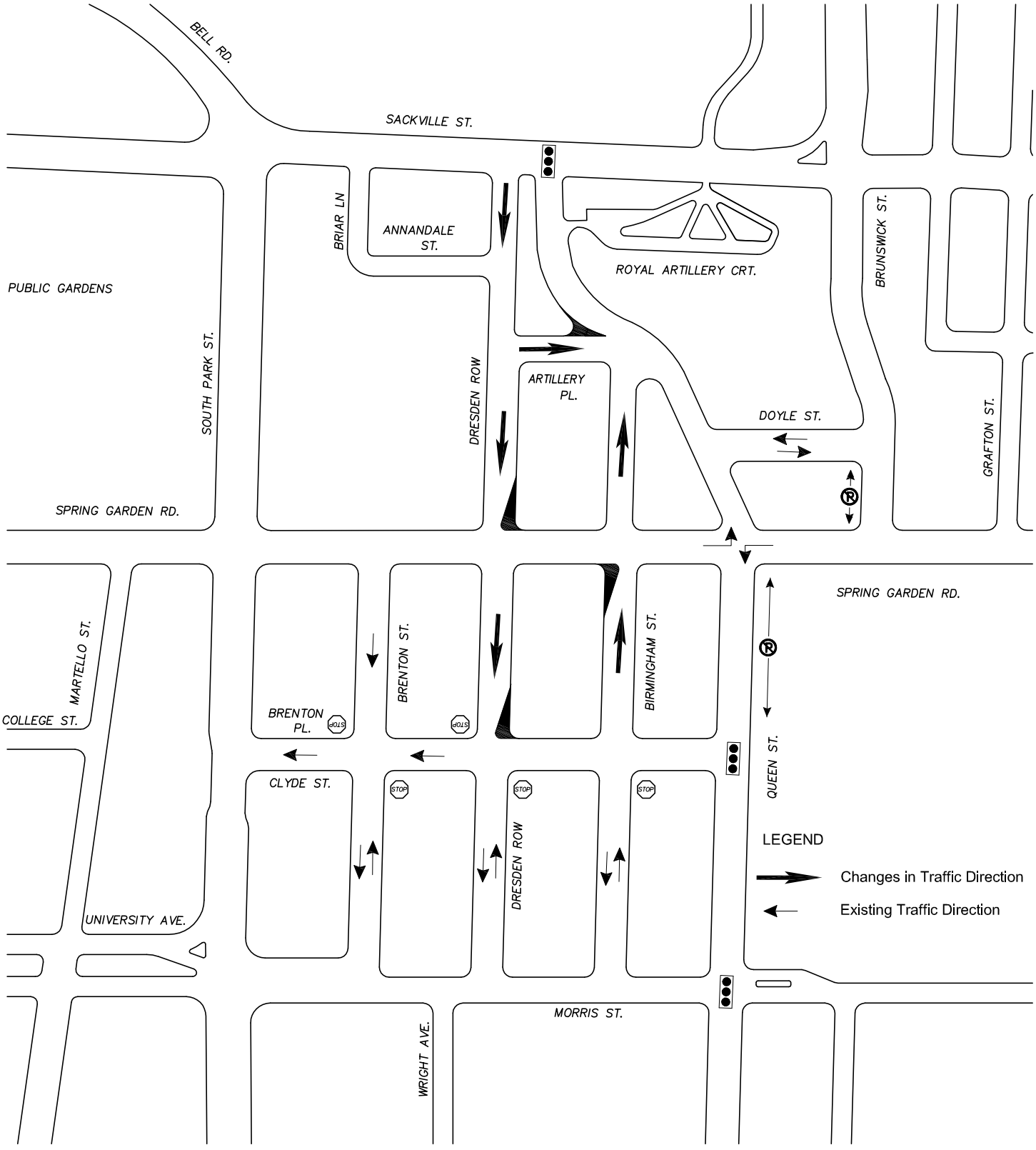
- Doyle Street should remain a two-way street.
- Brenton Place should remain a one-way street.
- Clyde Street should remain a one-way street between Brenton Street and Dresden Row.
- Traffic signals should be installed at the Queen Street and Morris Street intersection when traffic volumes warrant.
- Traffic signals should be installed at the Queen Street and Clyde Street intersection when traffic volumes warrant.
- An adjustment of the lane arrangement at the intersection of Queen Street and Spring Garden Road should be implemented to allow for opposing eastbound and westbound left lanes.
- The northbound right turn-through bay at the intersection of Queen Street and Spring Garden Road should be extended from 30m to 60m (loss of approximately 5 parking spots).
- All traffic signal timing should be optimized.
- Parking should be removed on Brunswick Street in order to extend the right turn lane from the intersection of Brunswick Street and Spring Garden Road to Doyle Street (loss of approximately six parking spots).
- Stop signs should be installed for the north/ south streets that intersect with Clyde or mini-roundabouts should be installed at these intersections.

As part of the one-way street scenarios, it is proposed that curb extensions be installed to physically block traffic from entering a one-way street at an intersection. The curb extensions would be built to extend approximately 2m into the roadway; thereby blocking the lane that would no longer be in use but having no impact on the remaining lane. The following locations are recommended for curb extensions.

- northeast corner of Dresden Row and Spring Garden Road,
- southwest corner of Birmingham Street and Spring Garden Road,
- northeast corner of Dresden Row and Clyde Street.

Since the southbound right turn movement from Queen Street to Artillery Place is prohibited with the change of Artillery Place to a one-way street eastbound, it is recommended to close the right turn bay southbound on Queen Street at Artillery Place. This additional curb extension would allow for more parking on Artillery Place and on Queen Street and would provide a more compact intersection which may increase safety at the intersection.

An illustration of the recommended scenario with the proposed modifications is shown in **Figure 17**.



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RECOMMENDED SCENARIO WITH MODIFICATIONS

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6.1 Cost estimate

A cost estimate for the modifications anticipated for each scenario was prepared. In Scenario B, other than the costs associated with the streetscape plan which have been estimated by others to be approximately $6.5 million, the prohibition of left turns is expected to cost approximately $500 for the purchase and installation of "No Left Turn" signs on Spring Garden Road.

For Scenario C, **Table 15** outlines the elements required for the operation of the one-way street scenario and the cost estimate for the purchase and installation of the items.

Table 15 Cost Estimate for Recommended Scenario

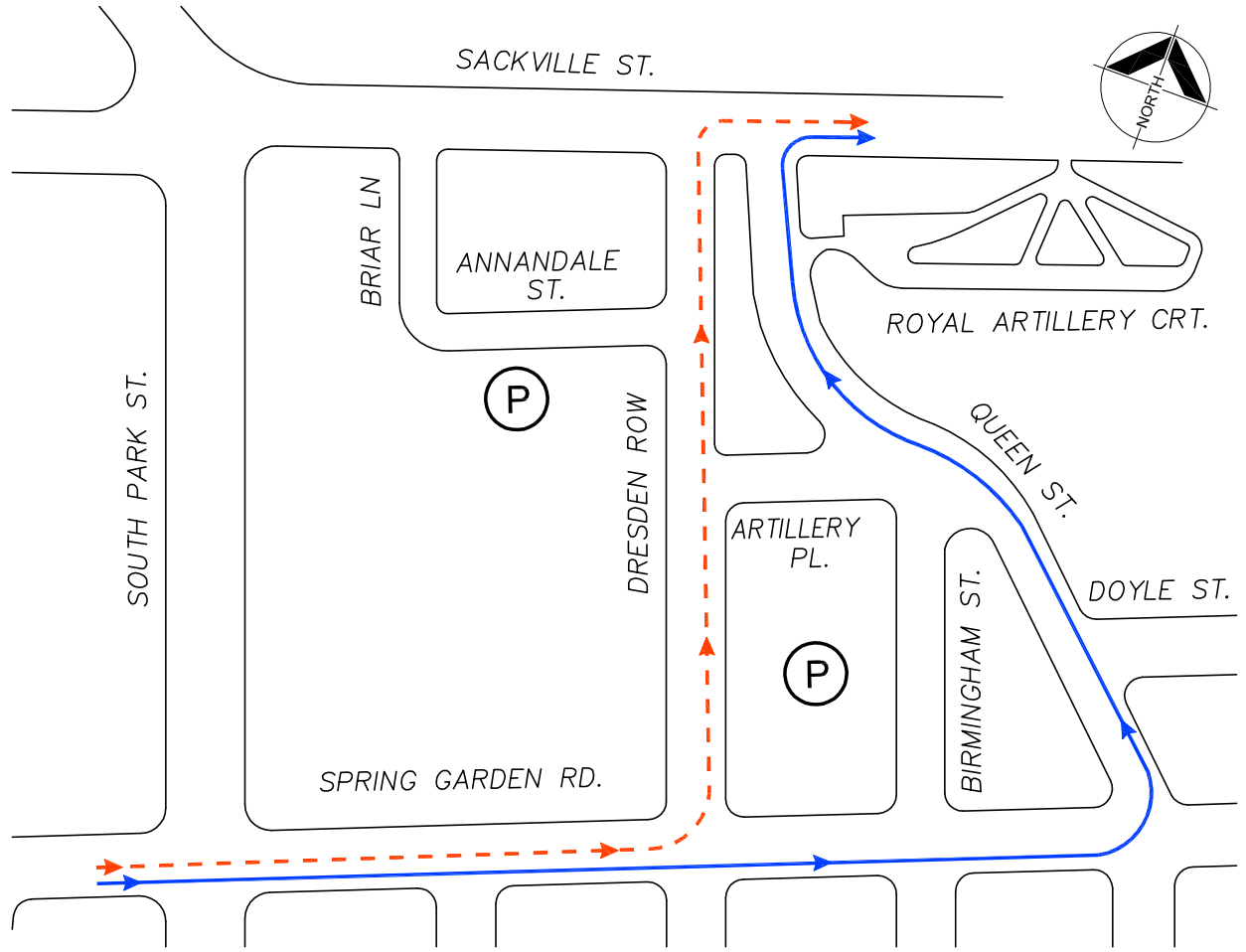
Scenario element	Item	Cost
Dresden Row one-way southbound	Purchase and installation of signs Construction of a curb extensions at the northeast corner of Dresden Row and Clyde Street and the northeast corner of Dresden Row and Spring Garden Road Removal of northbound traffic signal heads	$500 $30,000 $8,000
Birmingham Street one-way northbound	Purchase and installation of signs Construction of a curb extension at the southwest corner of Dresden Row and Spring Garden Road	$500 $15,000
Artillery Place one-way eastbound	Purchase and installation of signs Closure of right turn channelization with a curb extension	$500 $25,000
Queen Street/ Sackville Street	Purchase and installation of traffic signals Pavement markings	$200,000 $2,000
Queen Street/ Spring Garden Road	Alignment of eastbound and westbound left turn lanes Removal of parking meters (to extend right turn-through lane)	Included in Scenario B costs $2,500
Queen Street/ Clyde Street	Purchase and installation of traffic signals Pavement markings	$200,000 $5,000
Queen Street/ Morris Street	Purchase and installation of traffic signals	$200,000
Brunswick Street/ Spring Garden Road	Removal of parking meters (to extend southbound right turn lane)	$2,500
Clyde Street	Stop sign removal on Clyde Street and installation on Dresden Row, Birmingham Street and Brenton Street OR installation of mini-roundabouts	$500 $50,000
	TOTAL	$695,000 to $744,500

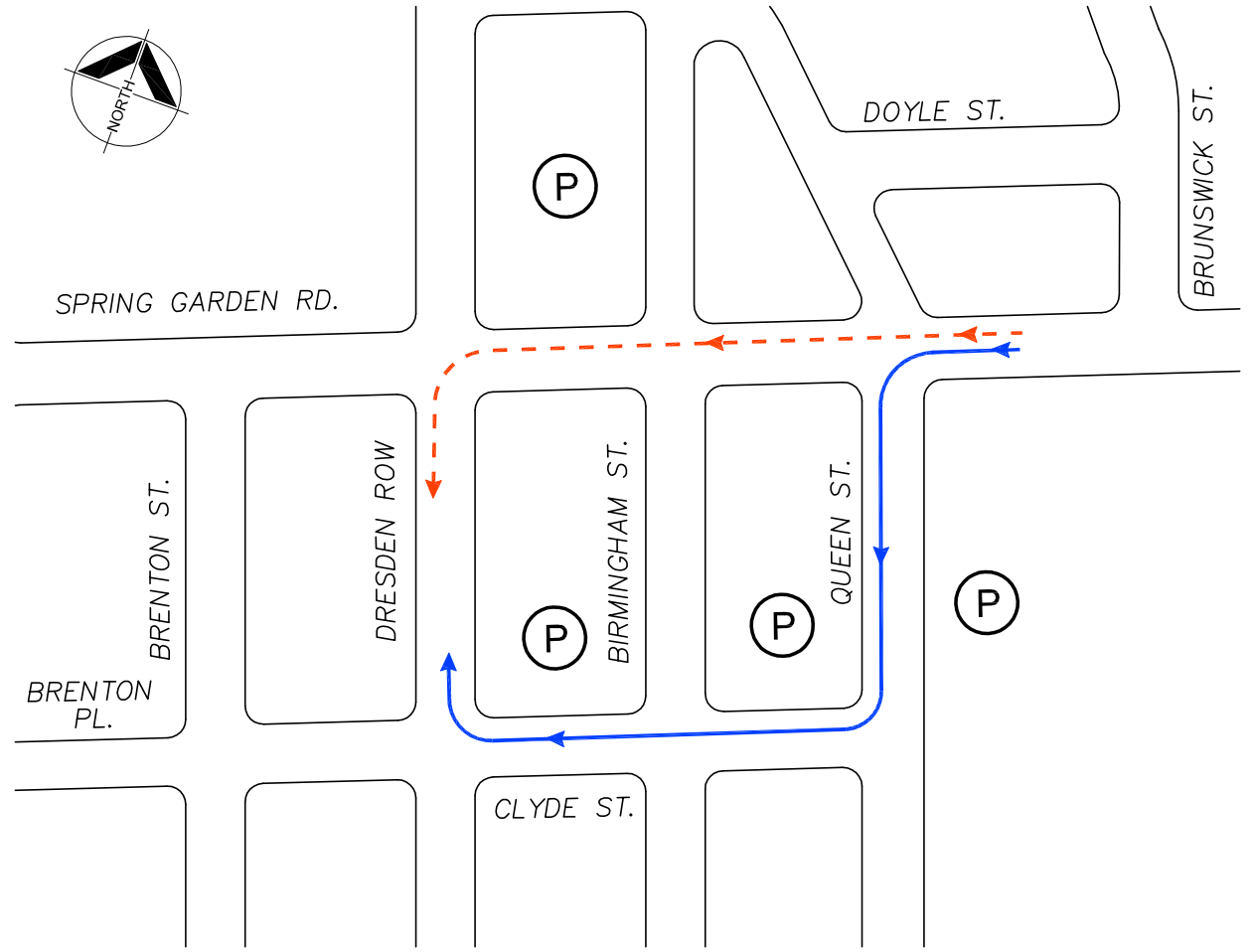
The cost estimate for the modifications required for Scenario C ranges from $695,000 for the plan including stop signs for the north/south approaches at the Clyde Street intersections to $744,500 for the plan which includes mini-roundabouts along Clyde Street.

Since Scenario D is a combination of Scenario C and Scenario B, the elements of each of the scenarios can be combined for a total cost of approximately $6.5 million for the streetscape plan and $800,000 for the one-way street elements.

Appendix A

Redistribution Traffic Patterns





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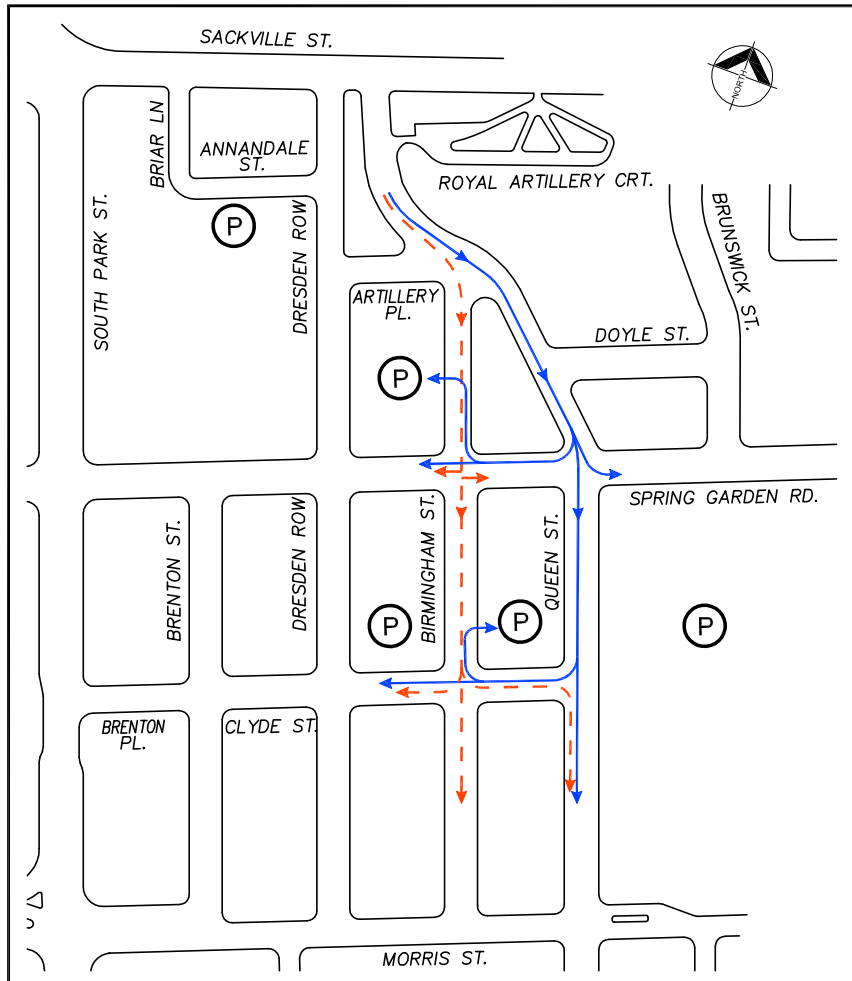
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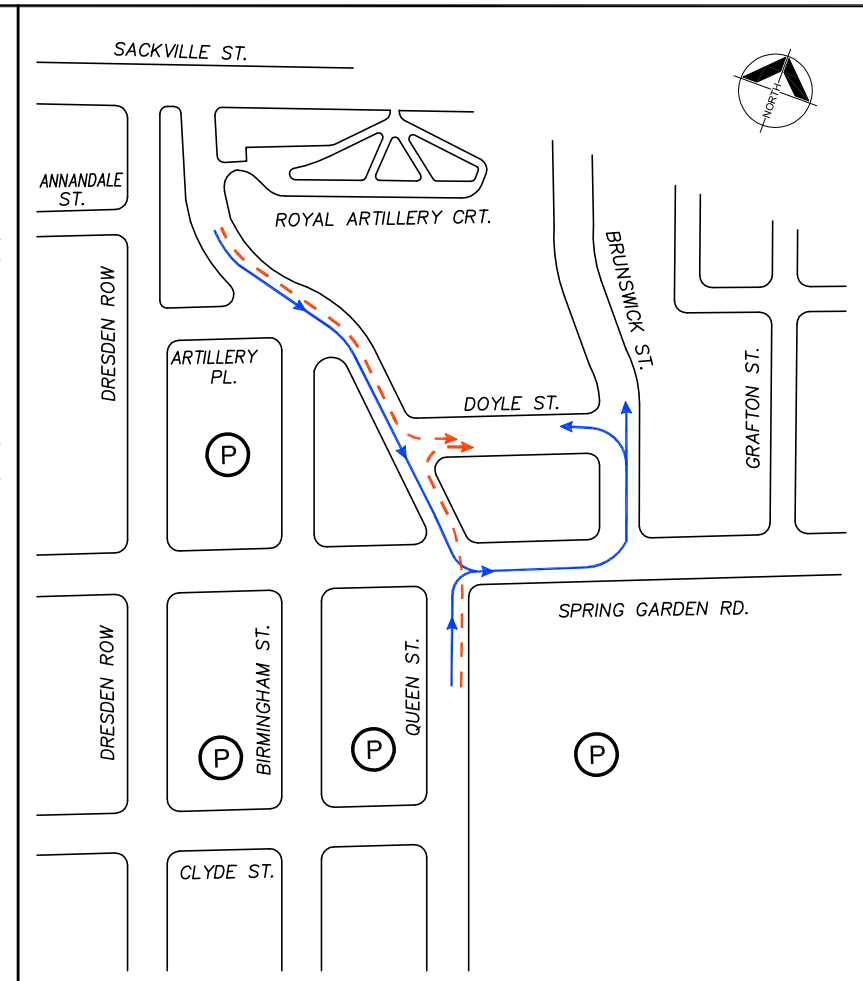
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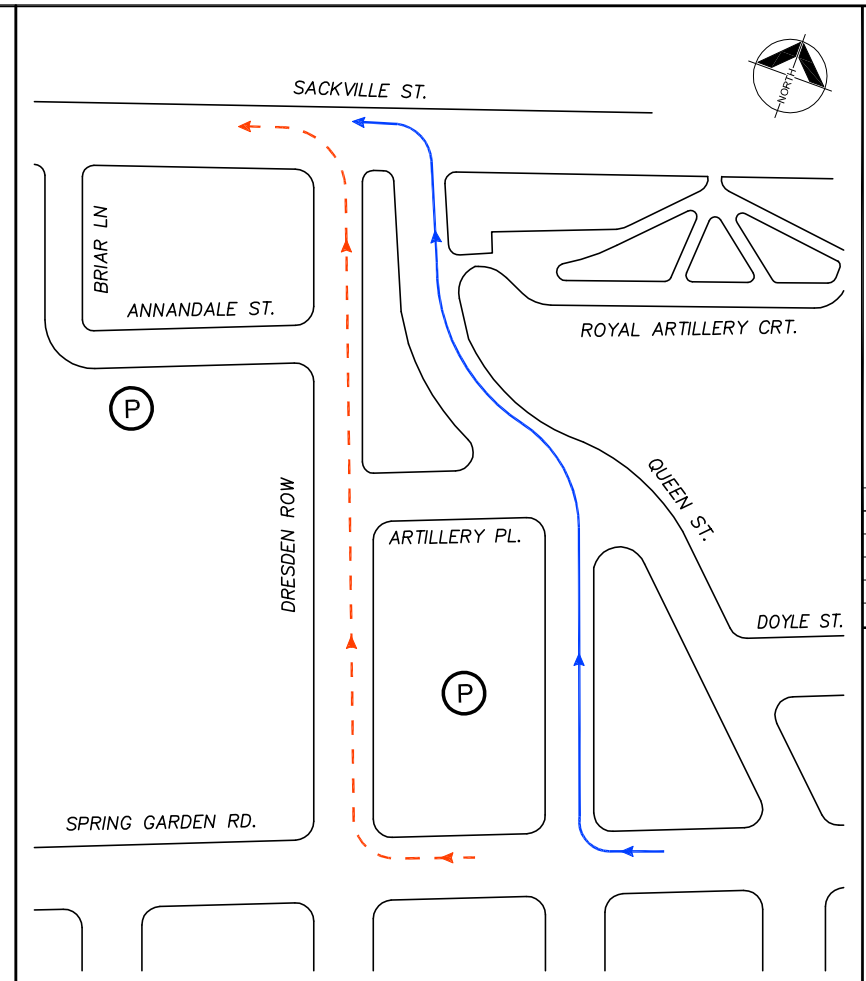
DRAWING:
SCENARIO B
Redistributed Traffic

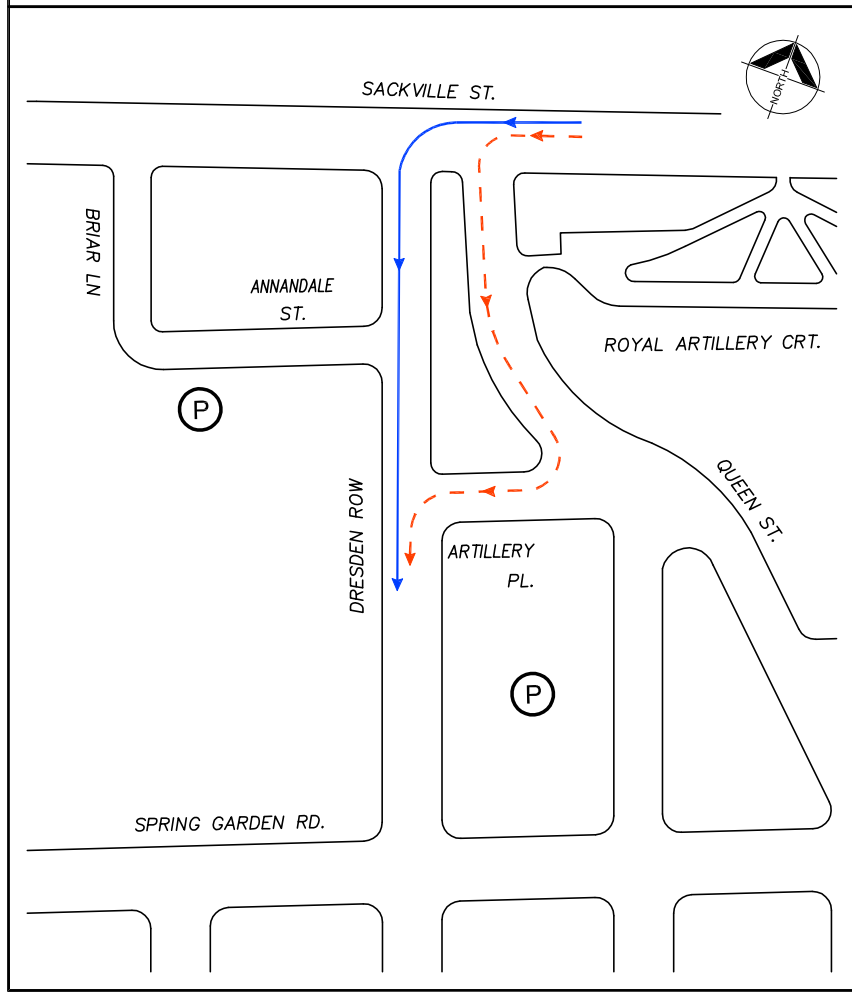
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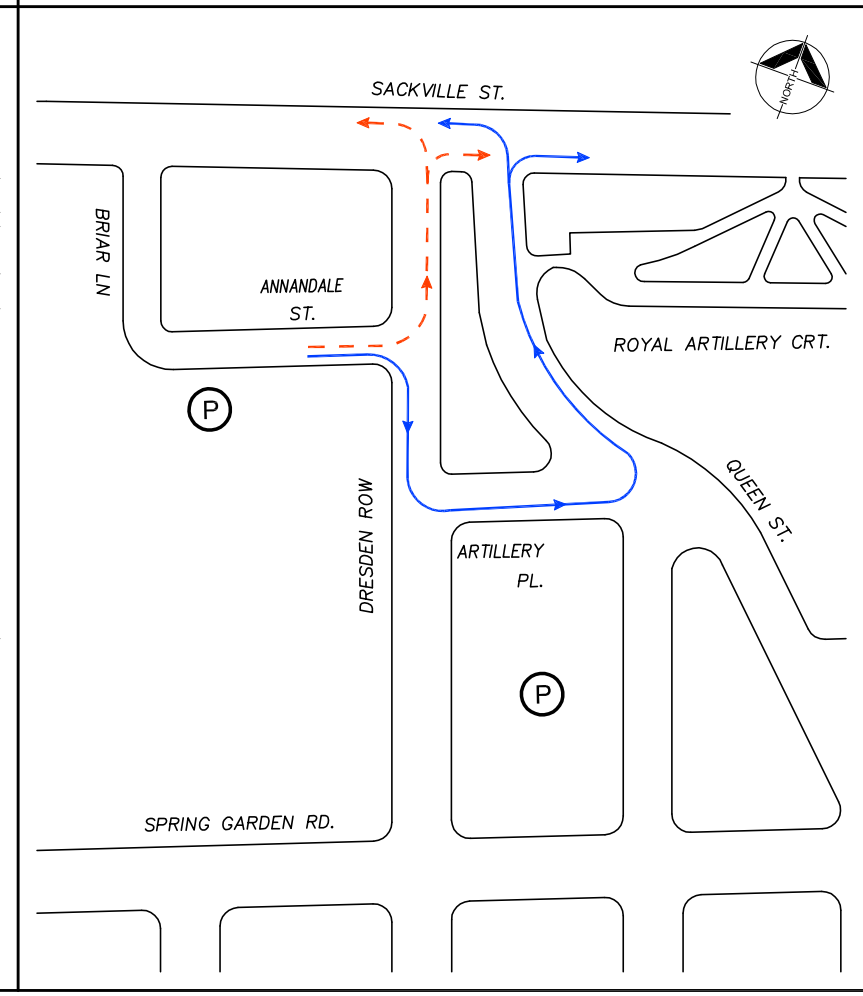
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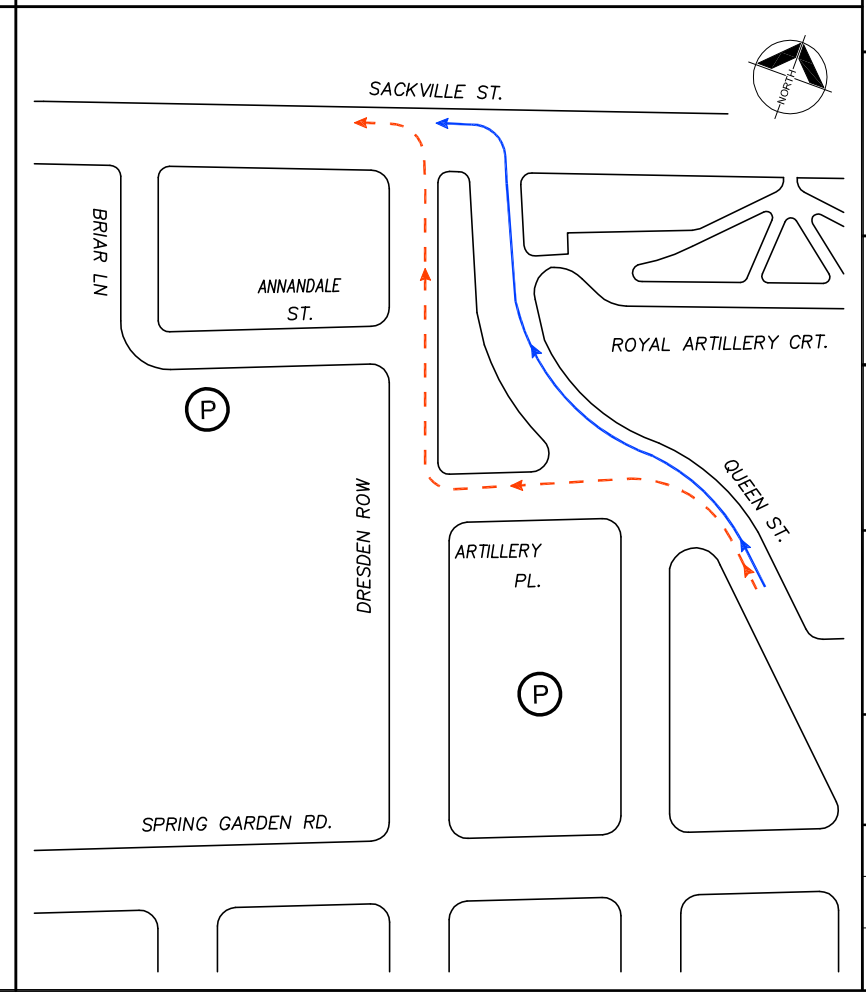












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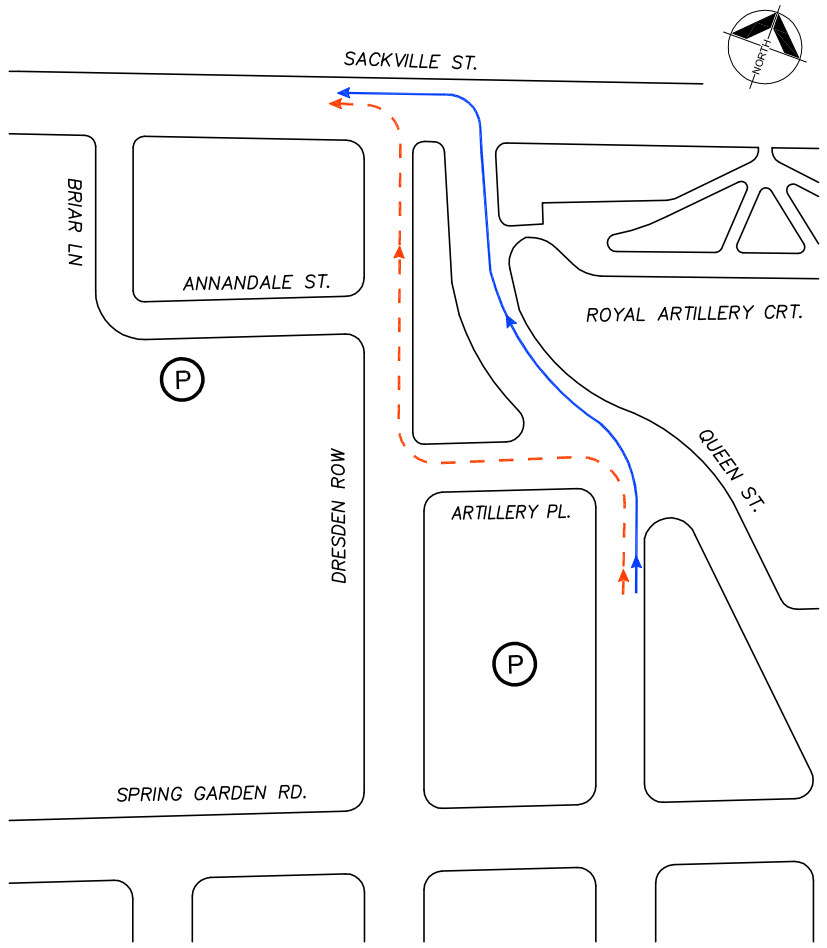
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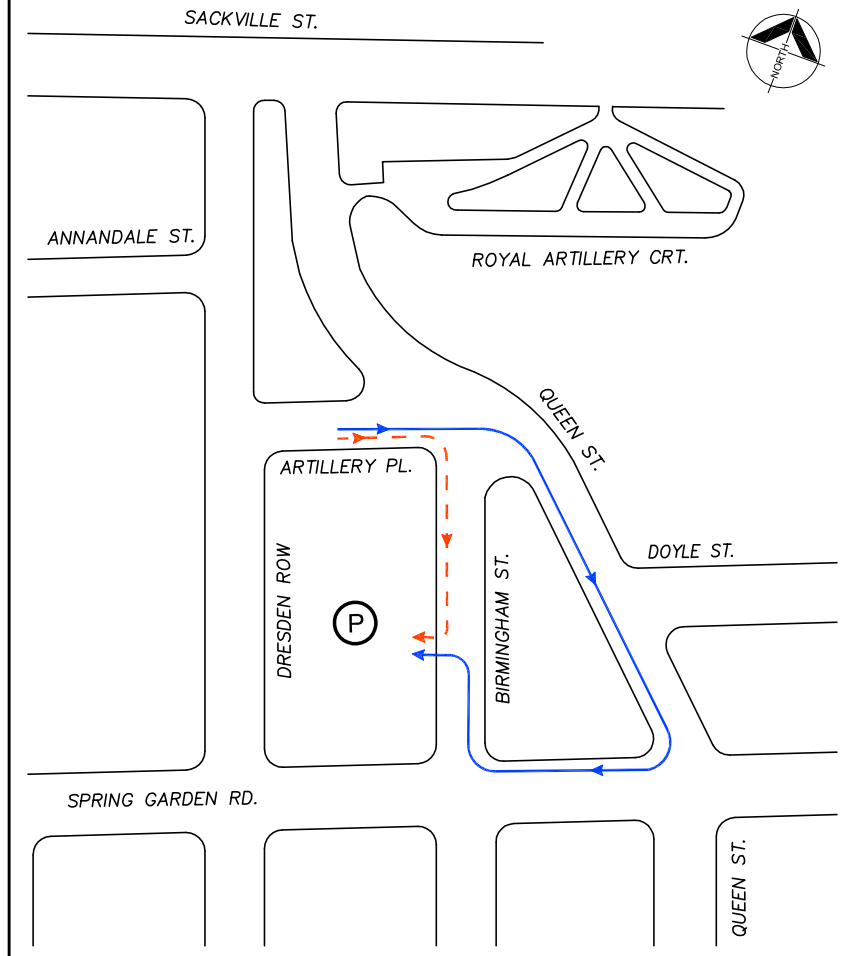
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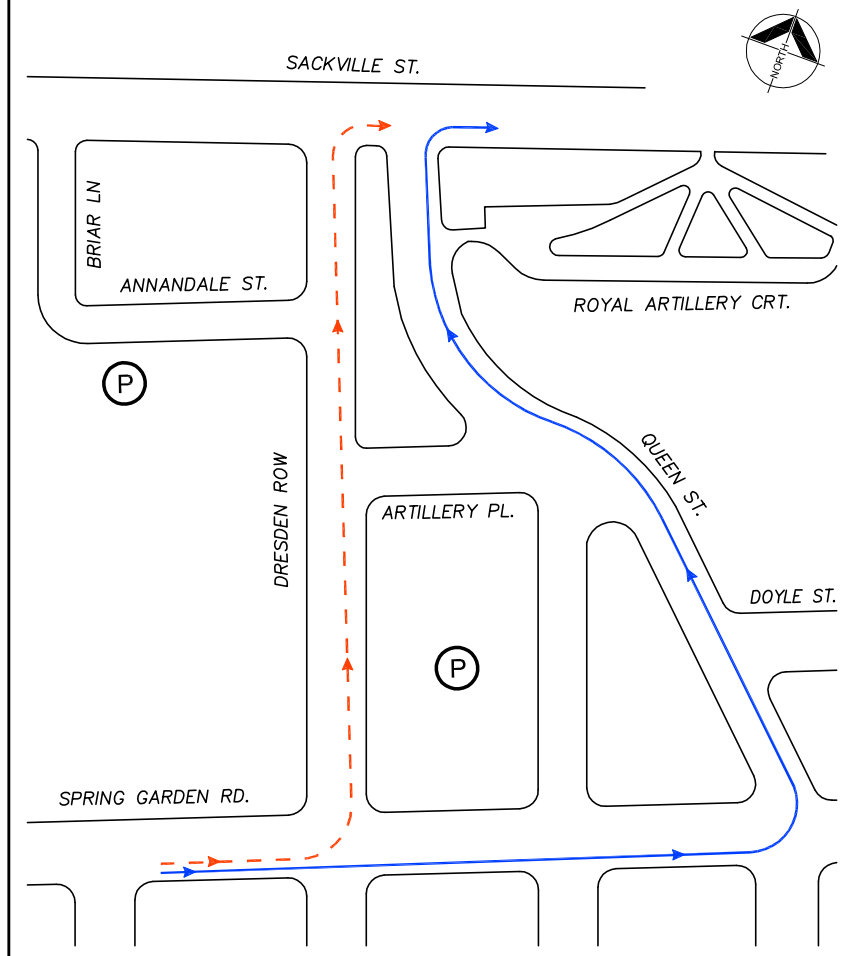
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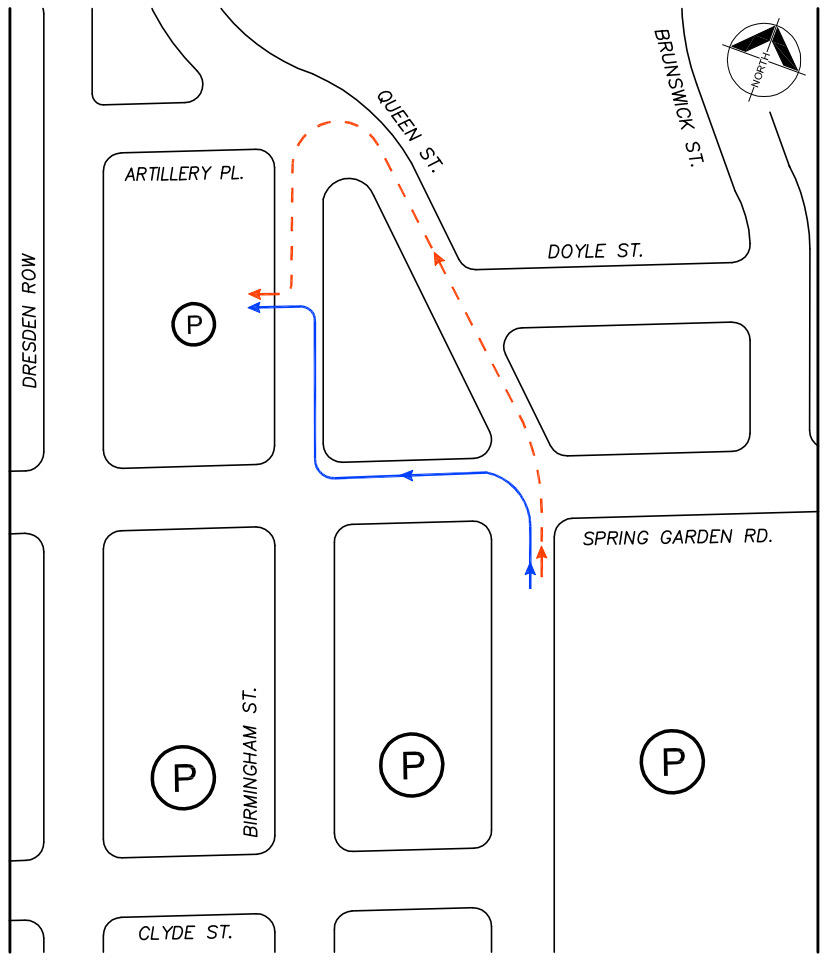
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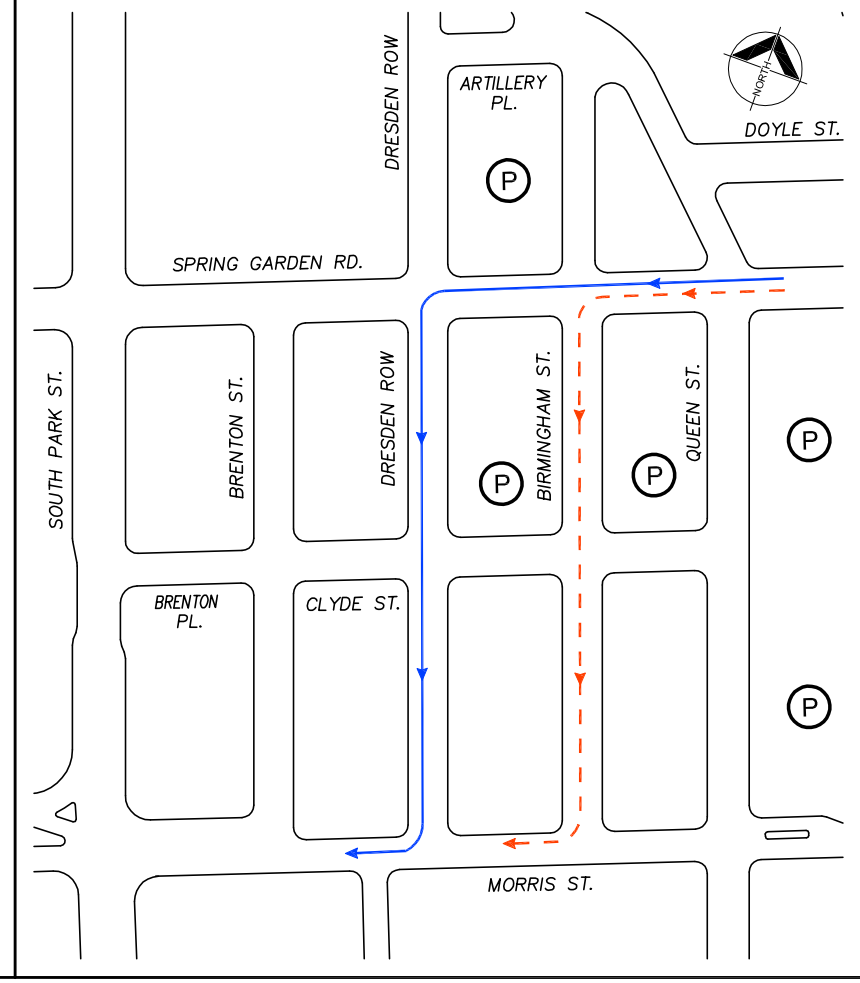
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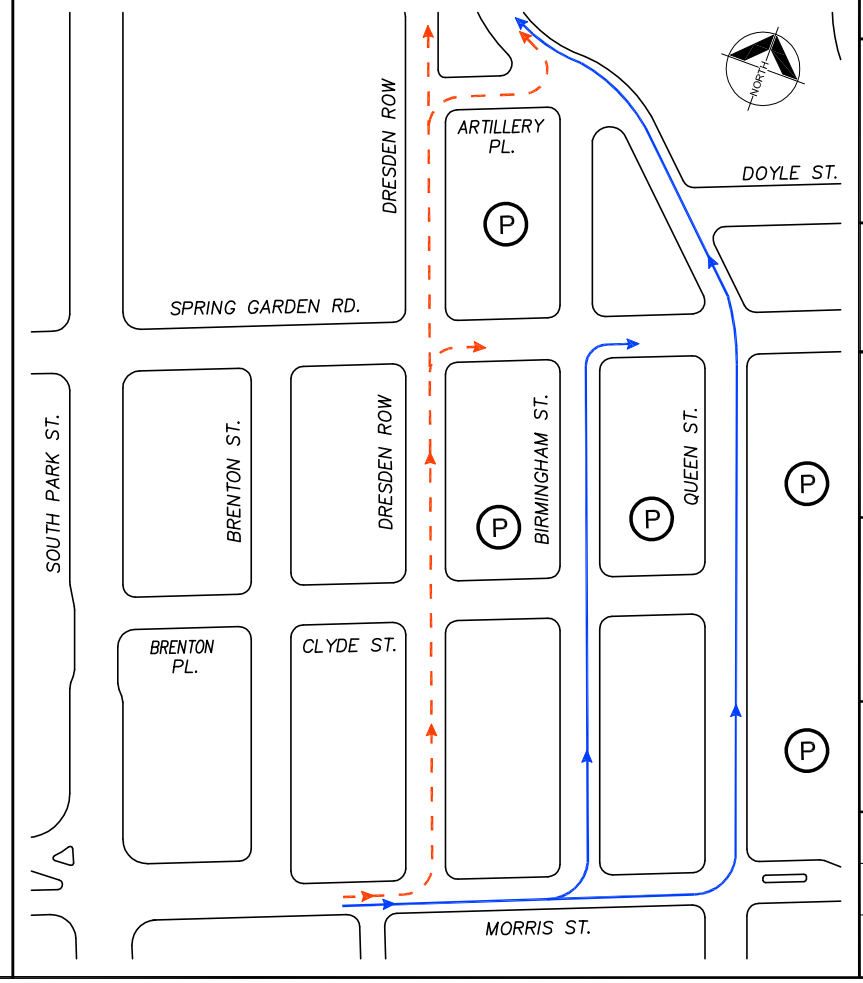












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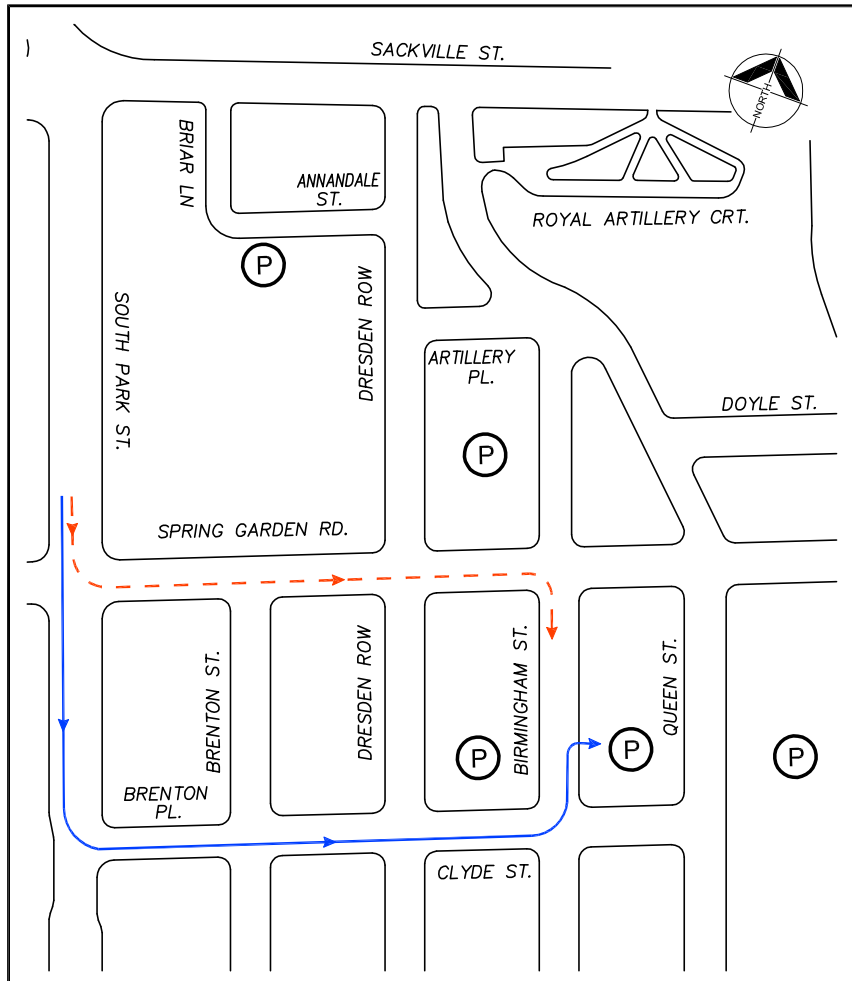
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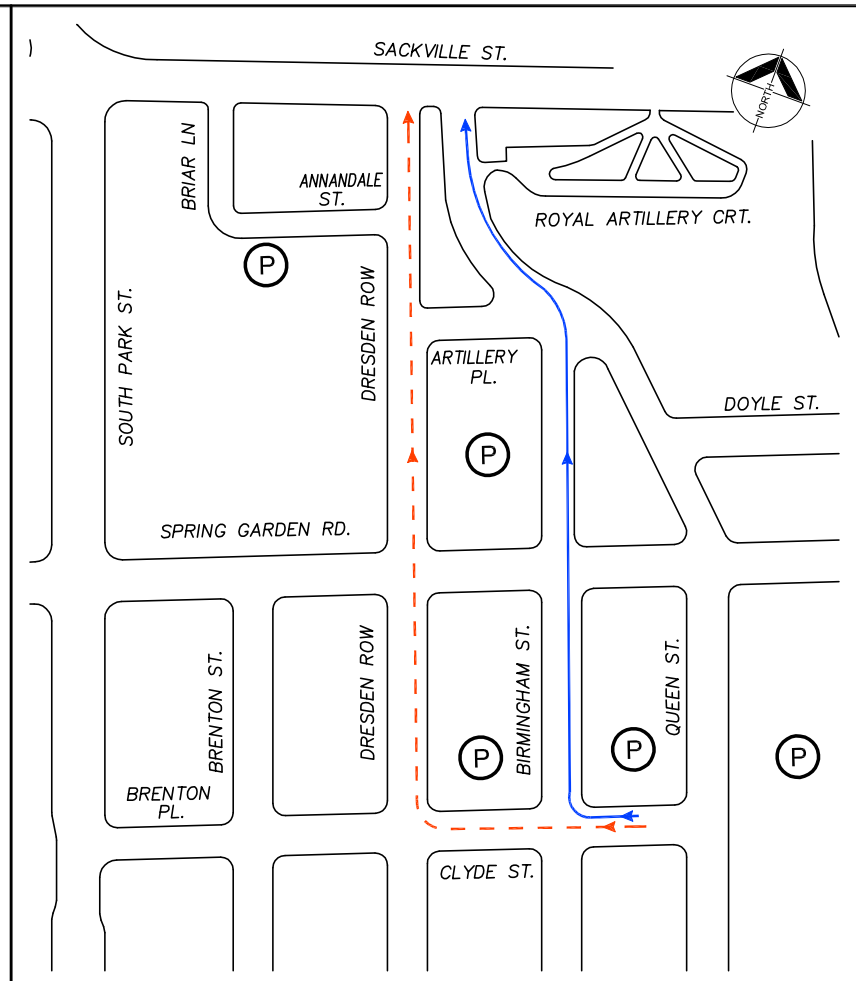
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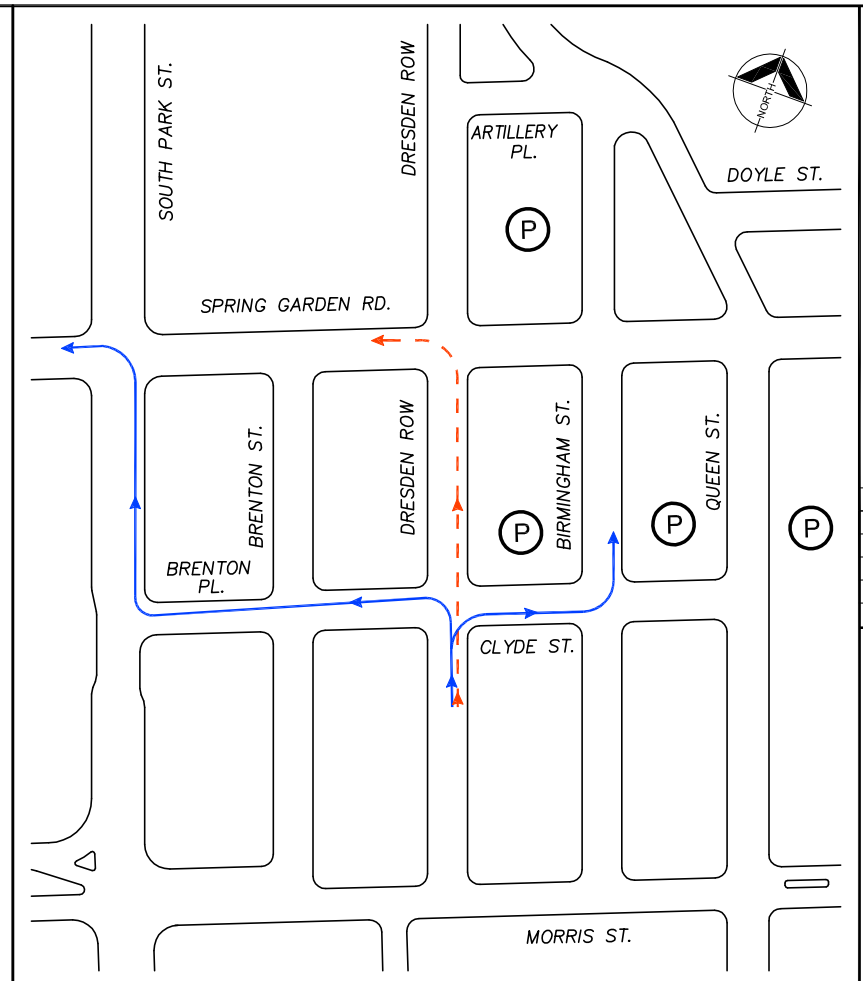
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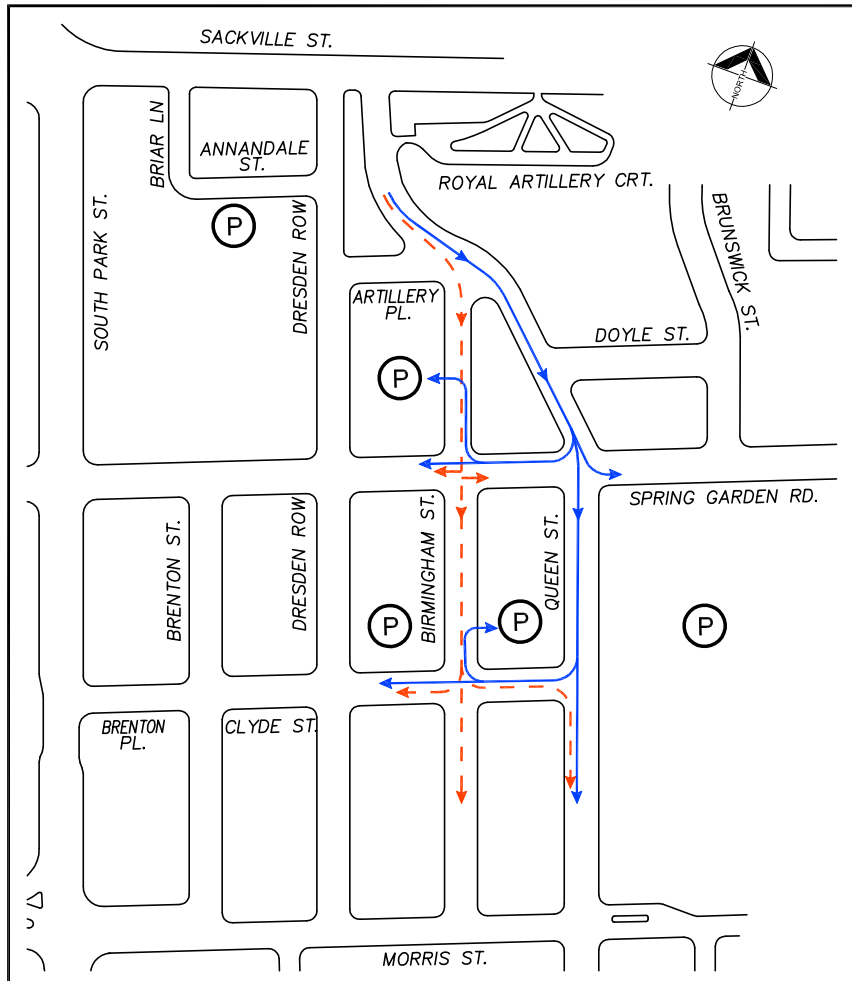
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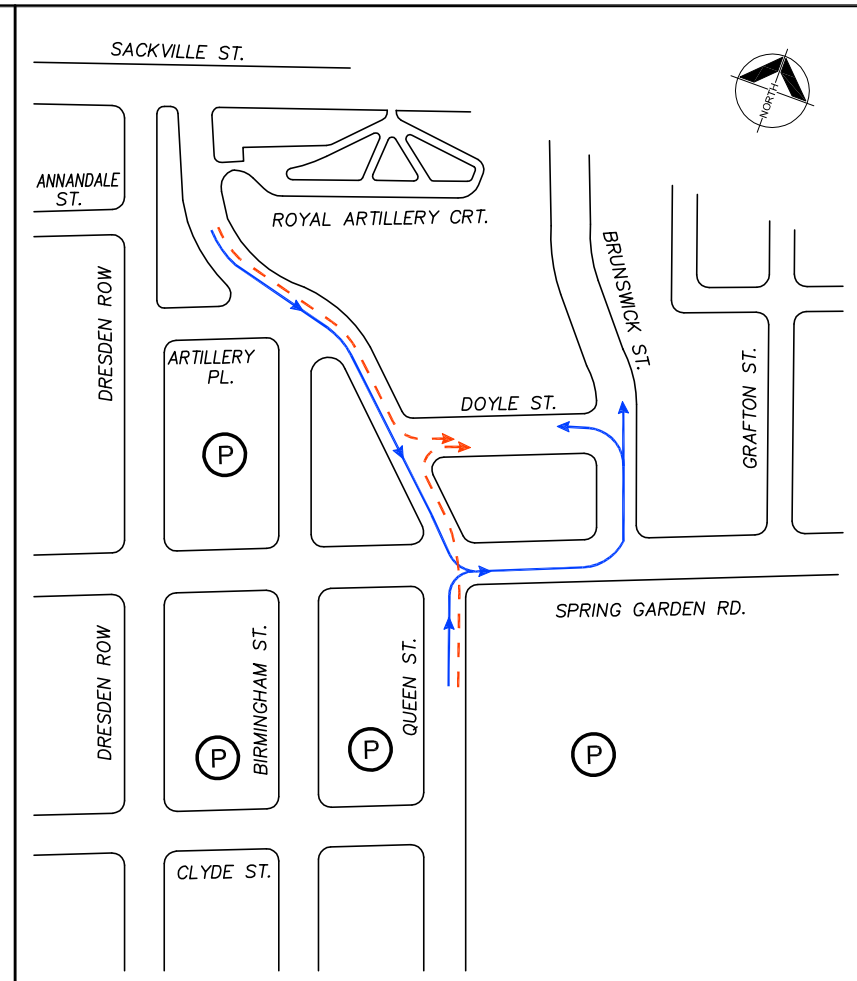
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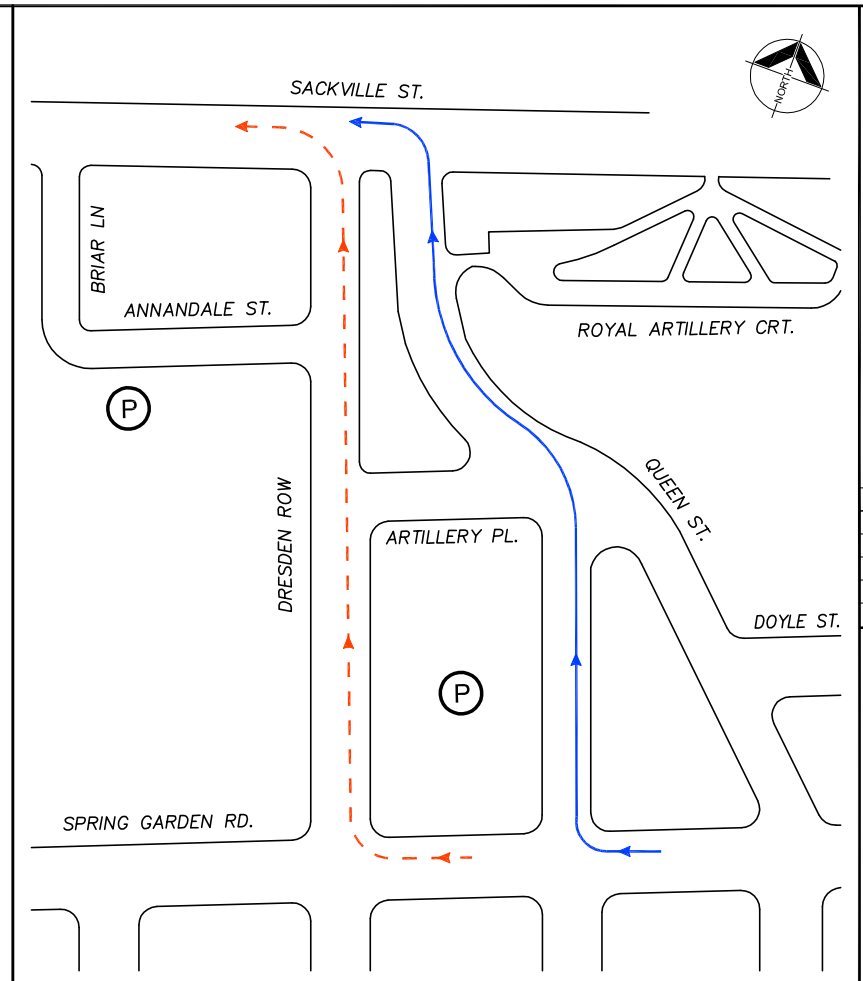
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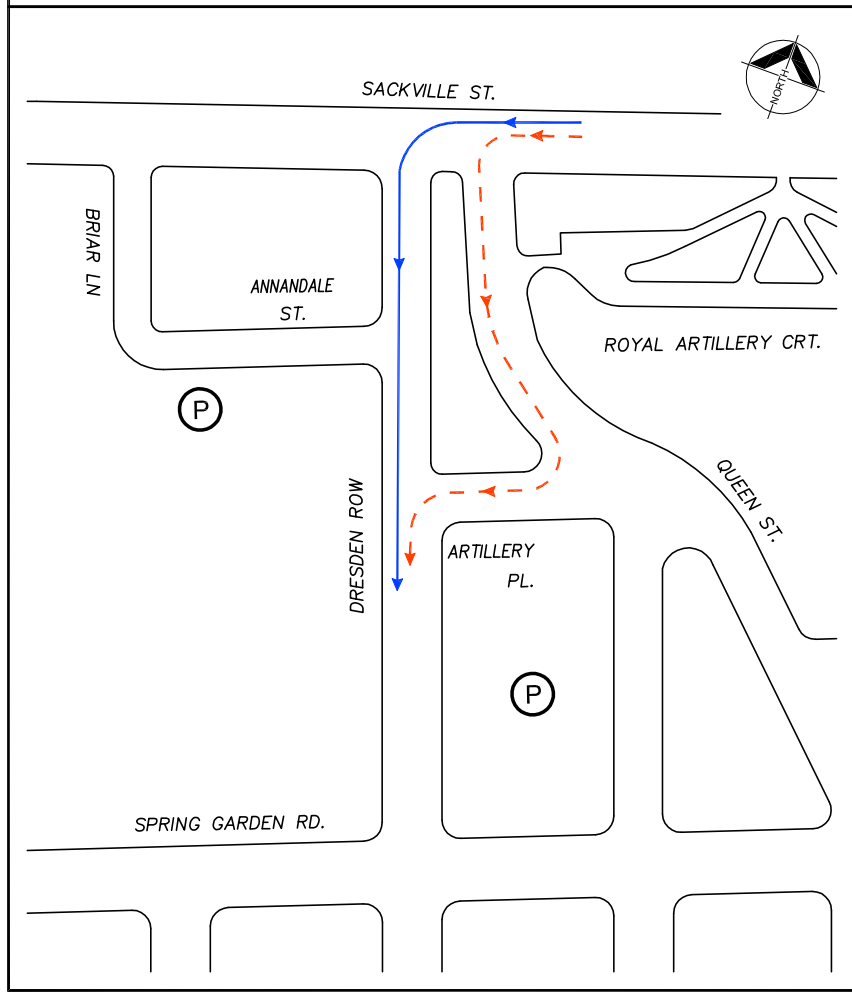
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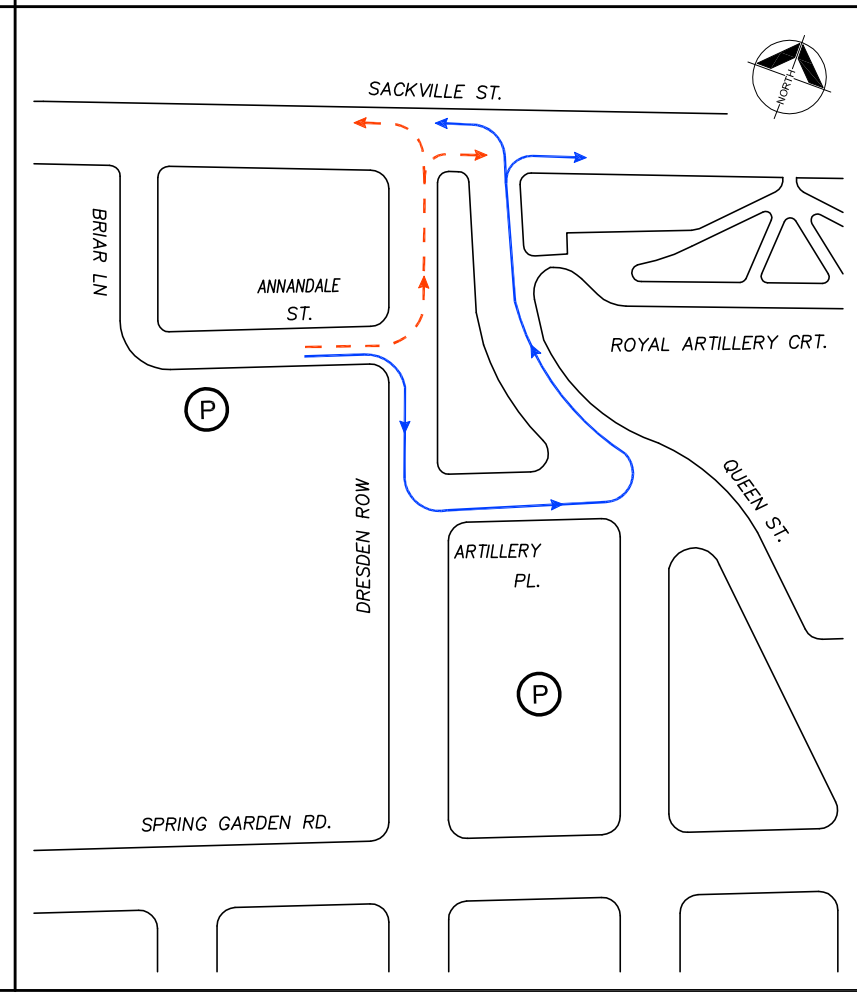
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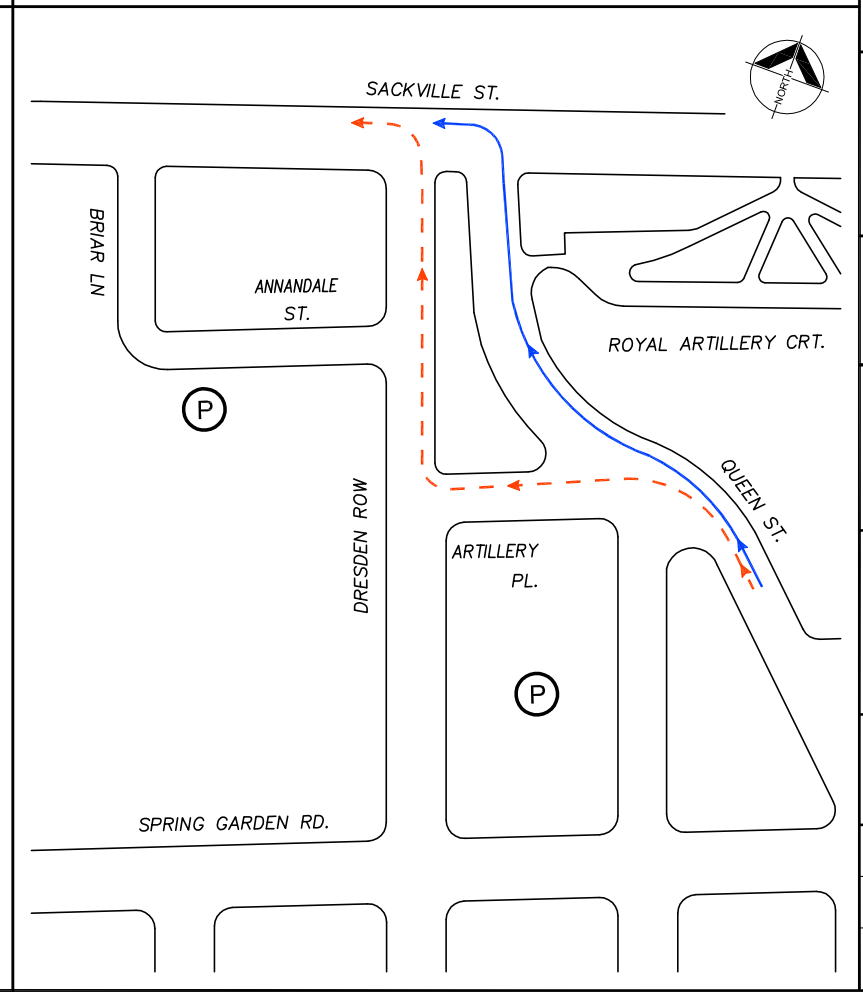












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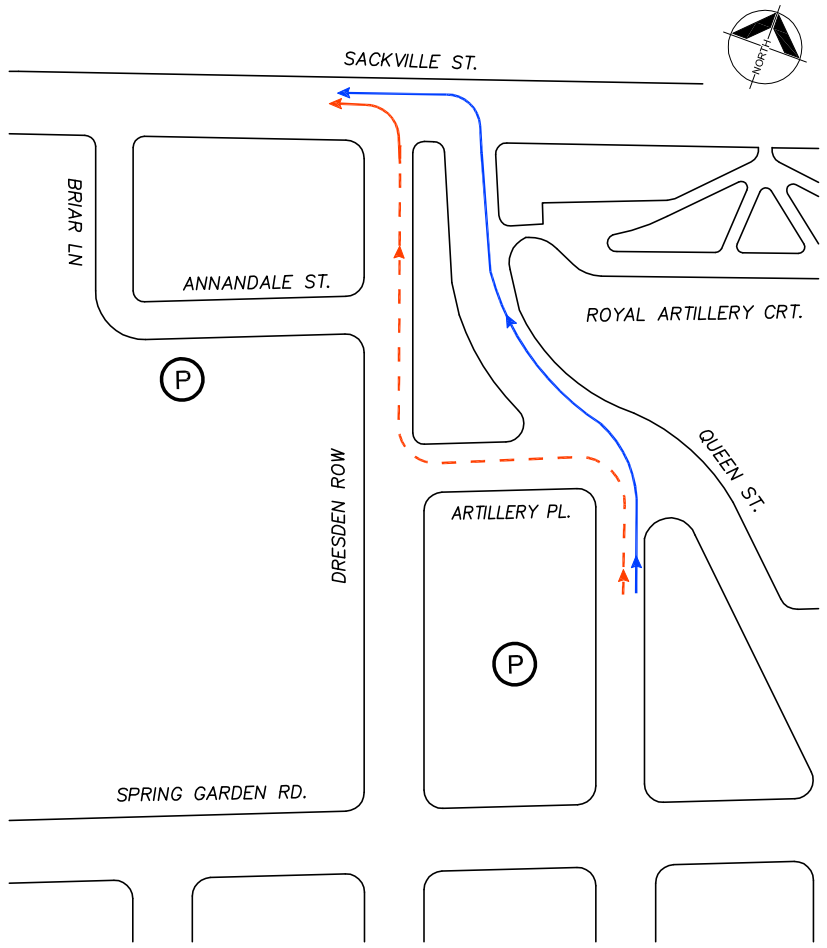
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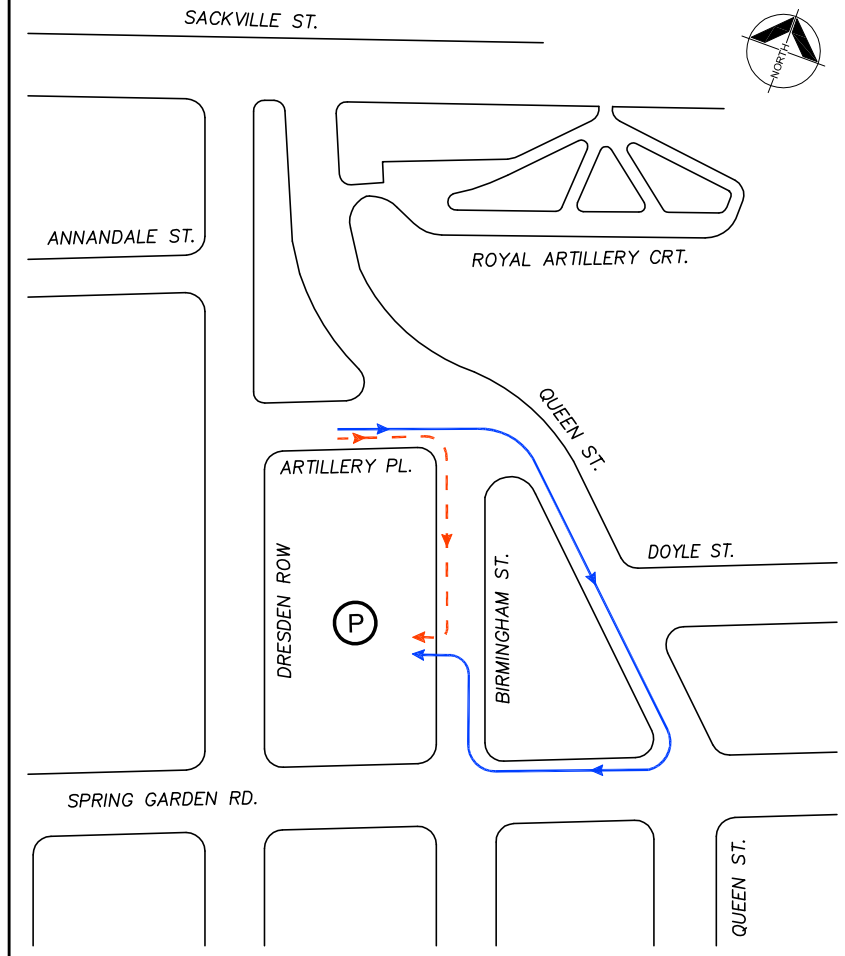
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Spring Garden Road Area

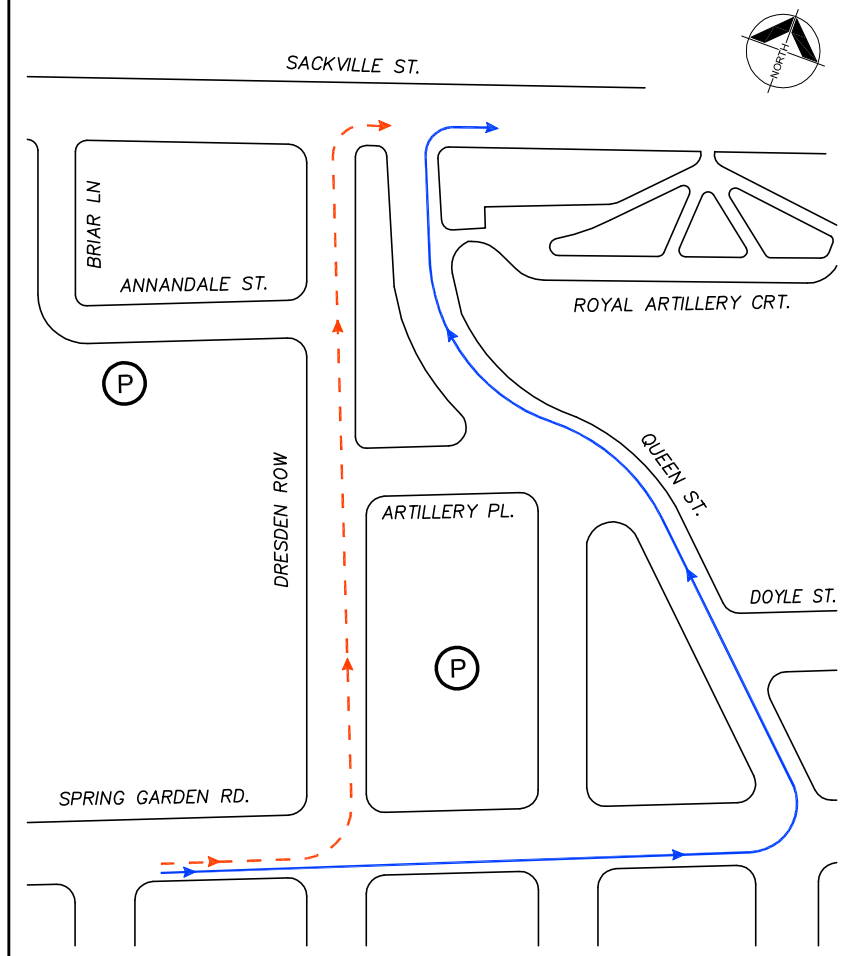
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SCENARIO D
Redistributed Traffic

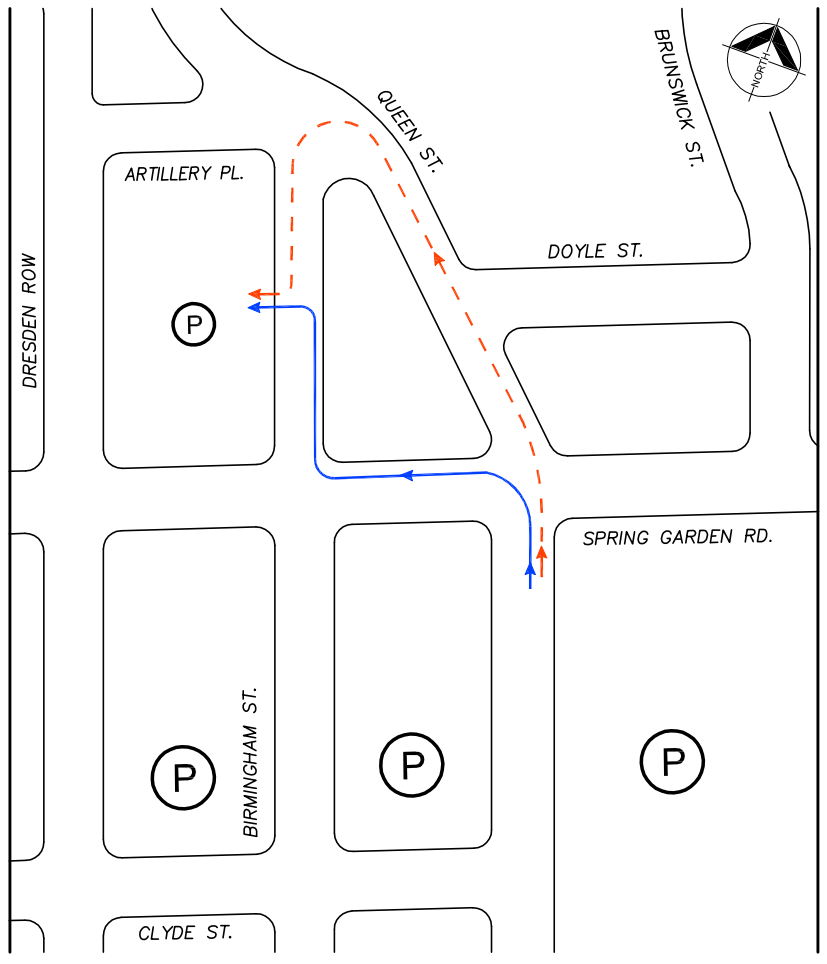
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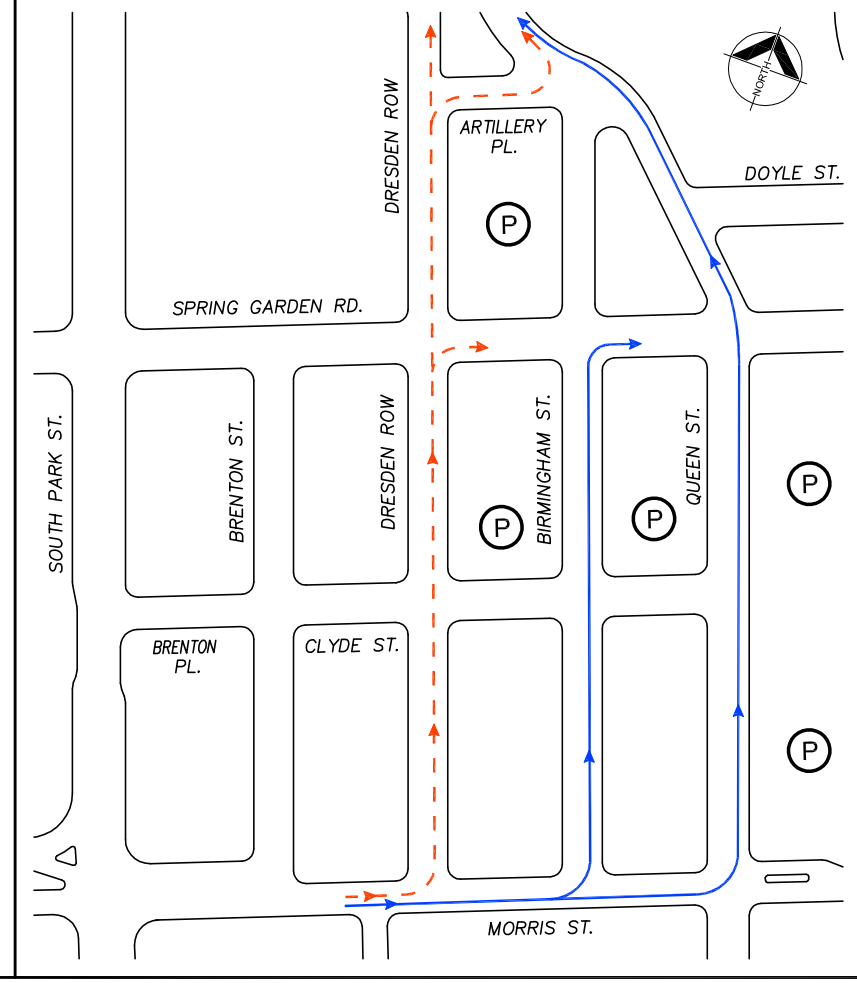
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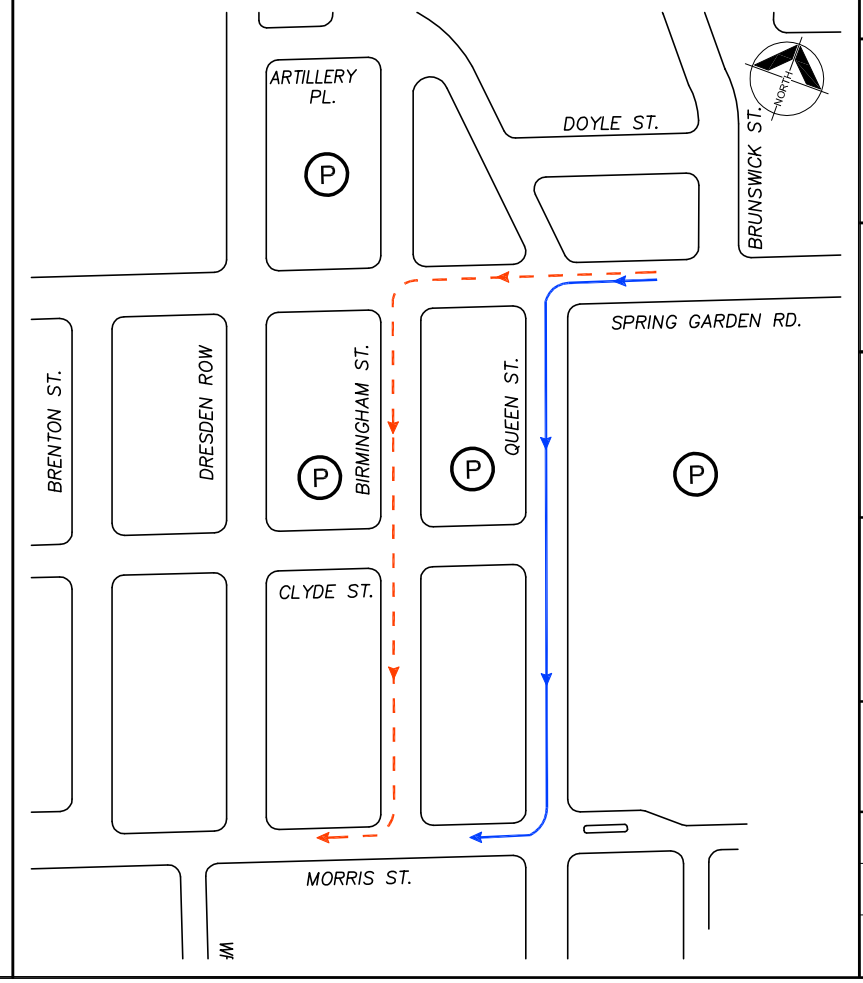












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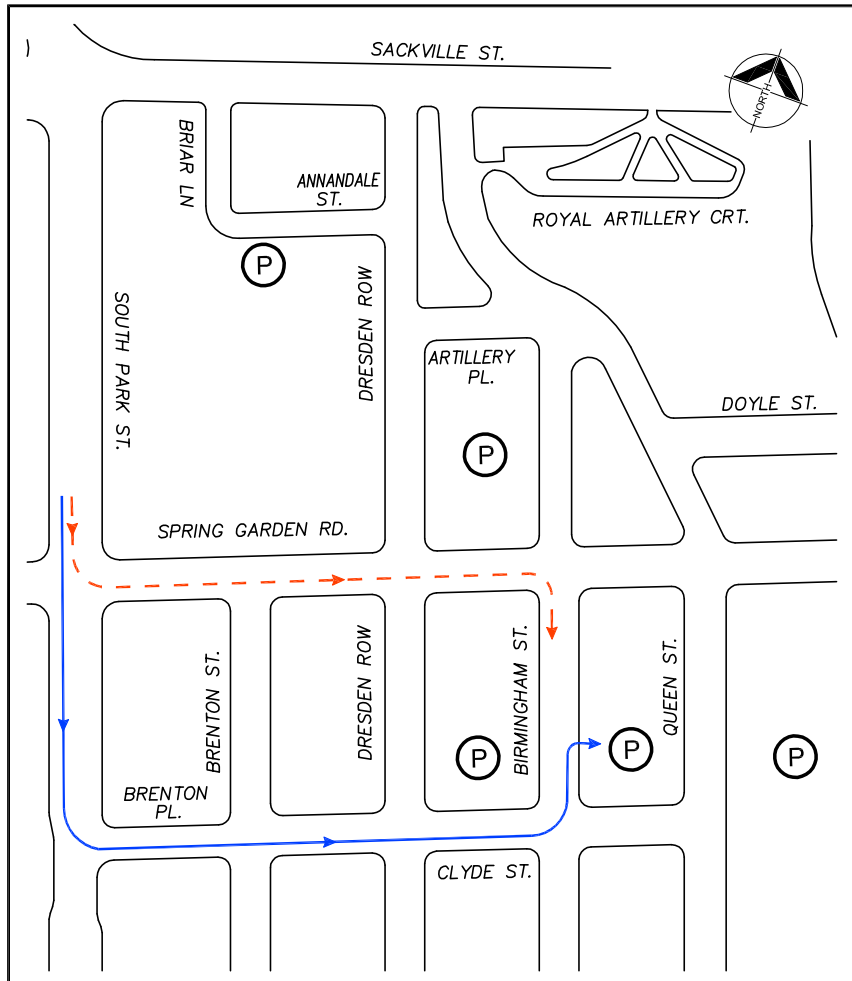
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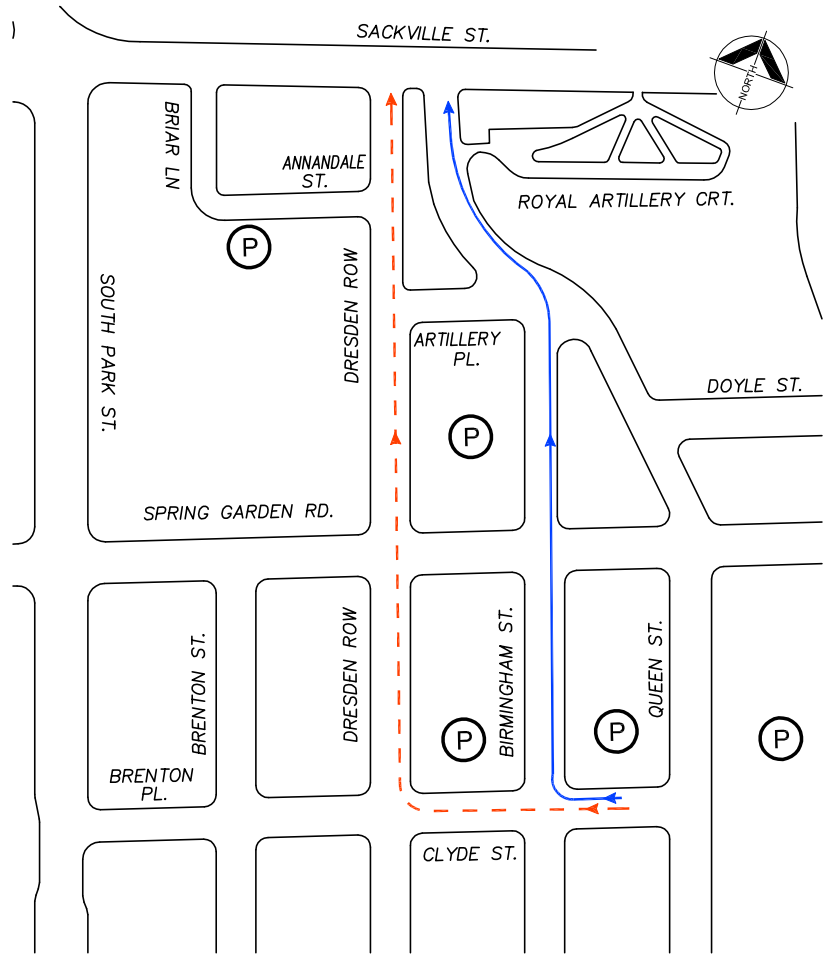
PROJECT:
Halifax Regional Municipality
Transportation Study
Spring Garden Road Area

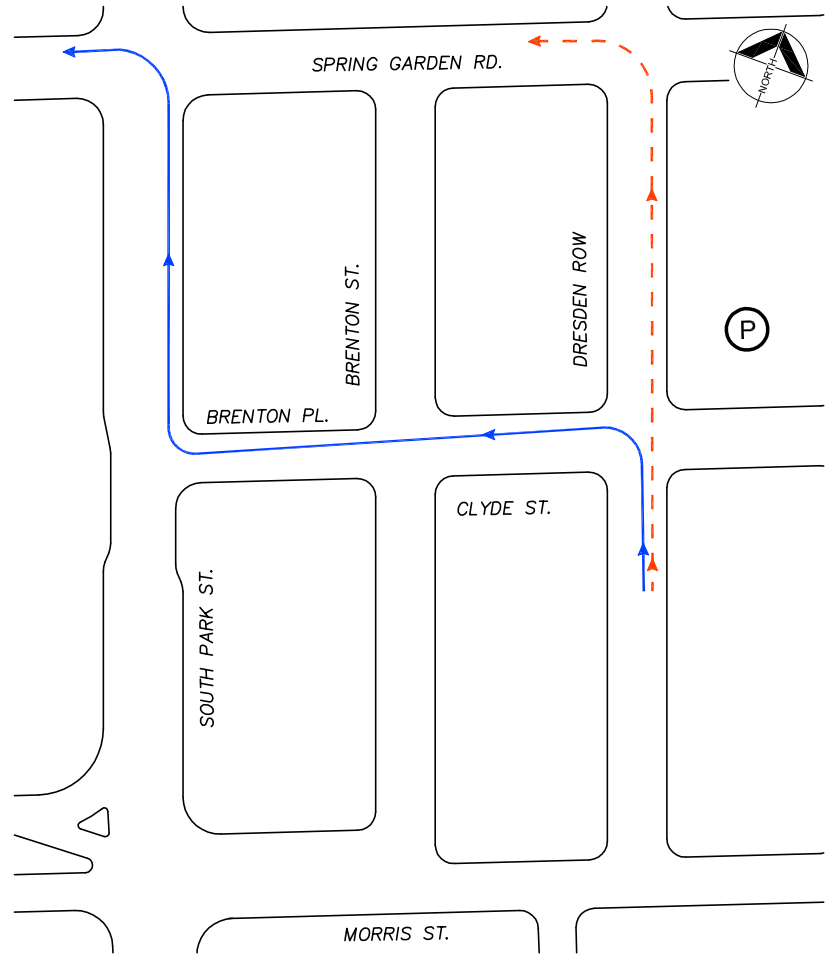
DRAWING:
SCENARIO D
Redistributed Traffic

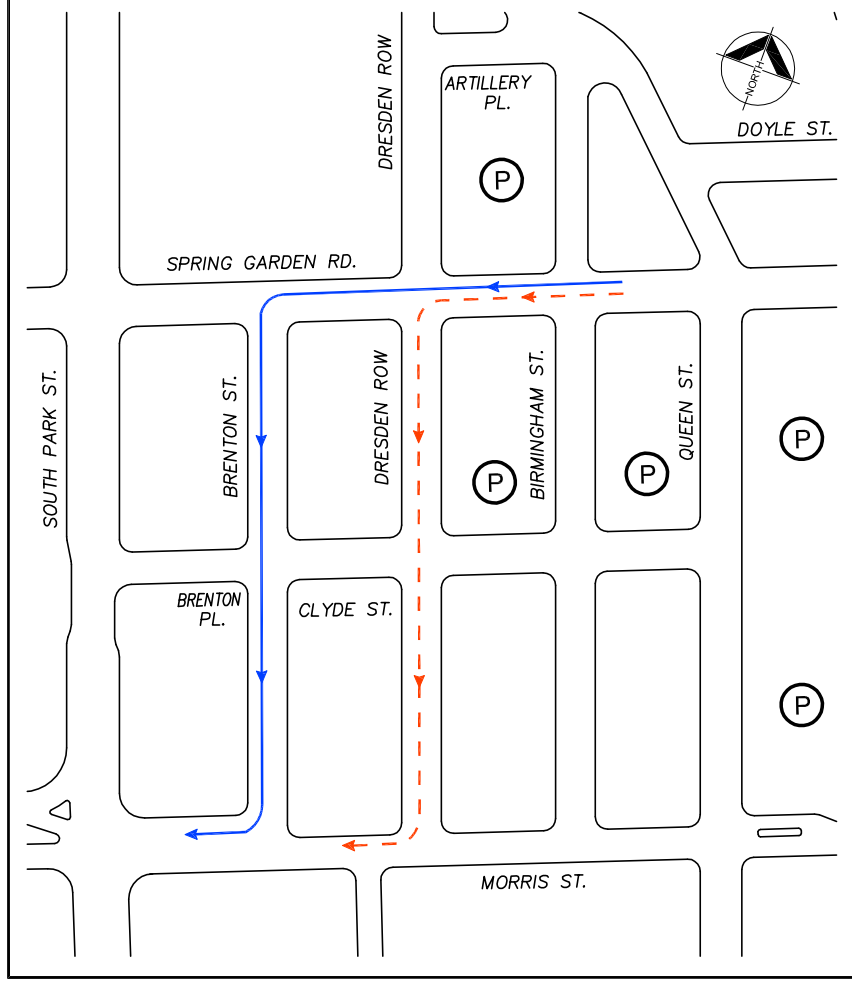
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CLIENT:
HALIFAX REGIONAL MUNICIPALITY

PROJECT:
Halifax Regional Municipality
Transportation Study
Spring Garden Road Area

DRAWING:
SCENARIO D
Redistributed Traffic

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Appendix B

Intersection Analysis Results

- Future Scenarios with Background Growth
- Future Scenarios with Background Growth and Development
- Future Scenarios with Background Growth with Modifications

Future Scenarios with background growth

Scenario A and Future Traffic including Background Growth Only

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.2	256	34.9	402	24.0	371	17.4	808
Sackville St. - Dresden Row	0.0	982	4.9	503	250.7	82	-	-
Sackville St. - Queen St.	0.0	738	3.7	550	42.7	101	-	-
Sackville St. - Brunswick St.	12.5	610	27.9	75	19.4	195	206.0	979
Artillery Pl. - Dresden Row	-	-	9.5	13	0.0	66	0.8	199
Artillery Pl. - Birmingham St.	1.4	20	2.4	78	4.2	46	4.0	356
Doyle St. - Queen St.	-	-	11.7	63	0.0	82	0.6	278
Doyle St. - Brunswick St.	9.8	16	-	-	0.0	72	0.0	156
Spring Garden Rd. - South Park St.	20.6	365	14.7	276	20.3	491	11.4	514
Spring Garden Rd. - Brenton St..	0.0	361	0.9	241	-	-	-	-
Spring Garden Rd. - Dresden Row	10.7	301	9.1	226	15.1	40	18.7	148
Spring Garden Rd. - Birmingham St.	0.8	269	0.5	233	57.6	19	64.1	26
Spring Garden Rd. - Queen St.	7.5	279	12.2	358	22.1	230	25.8	262
Spring Garden Rd. - Brunswick St.	3.9	311	0.0	230	-	-	95.2	196
Brenton Pl. - South Park St.	-	-	17.5	76	0.0	421	0.0	484
Clyde St. - Brenton St.	-	-	10.6	46	7.5	4	0.0	65
Clyde St. - Dresden Row	-	-	10.3	40	1.7	41	1.6	86
Clyde St. - Birmingham St.	10.1	21	10.1	46	2.1	21	1.0	24
Clyde St. - Queen St.	21.6	20	-	-	0.5	226	2.0	389
Morris St. - South Park St.	20.2	429	16.4	265	11.7	500	12.2	501
Morris St. - Brenton St.	0.3	349	0.0	241	-	-	14.3	30
Morris St. - Dresden Row	0.9	357	0.0	227	-	-	13.8	25
Morris St. - Birmingham St.	0.2	317	0.0	244	-	-	13.6	32
Morris St. - Queen St.	19.7	326	13.1	223	15.3	224	20.3	335

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	B
Sackville St. - Dresden Row	A	A	F	-
Sackville St. - Queen St.	A	A	E	-
Sackville St. - Brunswick St.	B	C	B	F
Artillery Pl. - Dresden Row	-	A	A	A
Artillery Pl. - Birmingham St.	A	A	A	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	A	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	B	B
Spring Garden Rd. - Birmingham St.	A	A	F	F
Spring Garden Rd. - Queen St.	A	B	C	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	C	A	A
Clyde St. - Brenton St.	-	B	A	A
Clyde St. - Dresden Row	-	B	A	A
Clyde St. - Birmingham St.	B	B	A	A
Clyde St. - Queen St.	C	-	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	B
Morris St. - Queen St.	C	B	C	C

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.72	3.90	2.47	3.90	12.00
Sackville St. - Dresden Row	0.00	0.68	5.69	-	6.38
Sackville St. - Queen St.	0.00	0.57	1.20	-	1.76
Sackville St. - Brunswick St.	2.12	0.58	1.05	56.01	59.76
Artillery Pl. - Dresden Row	-	0.04	0.00	0.04	0.08
Artillery Pl. - Birmingham St.	0.01	0.05	0.05	0.40	0.51
Doyle St. - Queen St.	-	0.20	0.00	0.05	0.25
Doyle St. - Brunswick St.	0.04	-	0.00	0.00	0.04
Spring Garden Rd. - South Park St.	2.09	1.13	2.77	1.63	7.61
Spring Garden Rd. - Brenton St..	0.00	0.06	-	-	0.06
Spring Garden Rd. - Dresden Row	0.90	0.57	0.17	0.77	2.40
Spring Garden Rd. - Birmingham St.	0.06	0.03	0.30	0.46	0.86
Spring Garden Rd. - Queen St.	0.58	1.21	1.41	1.88	5.08
Spring Garden Rd. - Brunswick St.	0.34	0.00	-	5.18	5.52
Brenton Pl. - South Park St.	-	0.37	0.00	0.00	0.37
Clyde St. - Brenton St.	-	0.14	0.01	0.00	0.14
Clyde St. - Dresden Row	-	0.12	0.02	0.04	0.17
Clyde St. - Birmingham St.	0.06	0.13	0.01	0.01	0.21
Clyde St. - Queen St.	0.12	-	0.03	0.22	0.37
Morris St. - South Park St.	2.41	1.21	1.62	1.70	6.94
Morris St. - Brenton St.	0.03	0.00	-	0.12	0.15
Morris St. - Dresden Row	0.09	0.00	-	0.09	0.18
Morris St. - Birmingham St.	0.02	0.00	-	0.12	0.14
Morris St. - Queen St.	1.78	0.81	0.95	1.89	5.43

Scenario A - Total Vehicle Hours of Delay (AM)	116.42

Intersection Type

Signalized	Stop-Controlled

Legend

Level of Service

Acceptable	Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.7	237	30.3	701	16.9	740	15.7	512
Sackville St. - Dresden Row	0.0	530	1.9	579	239.5	243	-	-
Sackville St. - Queen St.	0.0	724	2.3	605	455.2	340	-	-
Sackville St. - Brunswick St.	30.3	763	31.0	200	32.4	403	83.9	665
Artillery Pl. - Dresden Row	-	-	13.8	54	0.0	155	1.6	231
Artillery Pl. - Birmingham St.	1.6	63	3.9	245	10.0	122	3.6	256
Doyle St. - Queen St.	-	-	14.9	56	0.0	309	2.1	170
Doyle St. - Brunswick St.	15.6	103	-	-	0.2	271	0.0	185
Spring Garden Rd. - South Park St.	23.9	347	23.0	367	22.0	722	9.2	426
Spring Garden Rd. - Brenton St..	0.0	444	2.2	371	-	-	-	-
Spring Garden Rd. - Dresden Row	16.1	315	11.4	339	17.6	129	20.4	149
Spring Garden Rd. - Birmingham St.	0.8	325	0.6	357	285.3	77	248.2	38
Spring Garden Rd. - Queen St.	10.8	339	17.0	388	27.3	545	18.4	162
Spring Garden Rd. - Brunswick St.	5.2	473	3.6	477	-	-	35.2	123
Brenton Pl. - South Park St.	-	-	93.5	305	0.0	530	0.0	276
Clyde St. - Brenton St.	-	-	13.2	142	7.6	48	0.0	105
Clyde St. - Dresden Row	-	-	13.0	121	1.1	69	1.5	139
Clyde St. - Birmingham St.	12.2	41	12.7	105	1.9	43	2.0	59
Clyde St. - Queen St.	35.2	48	-	-	1.1	464	0.1	248
Morris St. - South Park St.	22.8	409	20.4	557	15.3	709	11.0	315
Morris St. - Brenton St.	0.6	288	0.0	479	-	-	17.4	63
Morris St. - Dresden Row	1.6	325	0.0	449	-	-	18.2	49
Morris St. - Birmingham St.	1.2	268	0.0	442	-	-	16.3	39
Morris St. - Queen St.	62.6	290	61.8	514	87.8	344	41.2	246

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	B	B
Sackville St. - Dresden Row	A	A	F	-
Sackville St. - Queen St.	A	A	F	-
Sackville St. - Brunswick St.	C	C	C	F
Artillery Pl. - Dresden Row	-	B	A	A
Artillery Pl. - Birmingham St.	A	A	B	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	C	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	A
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	B	B	C
Spring Garden Rd. - Birmingham St.	A	A	F	F
Spring Garden Rd. - Queen St.	B	B	C	B
Spring Garden Rd. - Brunswick St.	A	A	-	E
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	-	B	A	A
Clyde St. - Dresden Row	-	B	A	A
Clyde St. - Birmingham St.	B	B	A	A
Clyde St. - Queen St.	E	-	A	A
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	F	F	F	E

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.63	5.90	3.48	2.23	13.24
Sackville St. - Dresden Row	0.00	0.31	16.17	-	16.47
Sackville St. - Queen St.	0.00	0.39	43.05	-	43.44
Sackville St. - Brunswick St.	6.42	1.73	3.63	15.50	27.28
Artillery Pl. - Dresden Row	-	0.21	0.00	0.10	0.31
Artillery Pl. - Birmingham St.	0.03	0.27	0.34	0.26	0.89
Doyle St. - Queen St.	-	0.23	0.00	0.10	0.33
Doyle St. - Brunswick St.	0.45	-	0.02	0.00	0.46
Spring Garden Rd. - South Park St.	2.31	2.35	4.41	1.09	10.15
Spring Garden Rd. - Brenton St..	0.00	0.23	-	-	0.23
Spring Garden Rd. - Dresden Row	1.41	1.07	0.63	0.84	3.96
Spring Garden Rd. - Birmingham St.	0.07	0.06	6.12	2.63	8.88
Spring Garden Rd. - Queen St.	1.02	1.83	4.14	0.83	7.81
Spring Garden Rd. - Brunswick St.	0.68	0.48	-	1.20	2.36
Brenton Pl. - South Park St.	-	7.91	0.00	0.00	7.91
Clyde St. - Brenton St.	-	0.52	0.10	0.00	0.62
Clyde St. - Dresden Row	-	0.44	0.02	0.06	0.52
Clyde St. - Birmingham St.	0.14	0.37	0.02	0.03	0.57
Clyde St. - Queen St.	0.47	-	0.14	0.01	0.62
Morris St. - South Park St.	2.59	3.15	3.01	0.96	9.72
Morris St. - Brenton St.	0.05	0.00	-	0.30	0.35
Morris St. - Dresden Row	0.14	0.00	-	0.25	0.39
Morris St. - Birmingham St.	0.09	0.00	-	0.18	0.27
Morris St. - Queen St.	5.04	8.83	8.39	2.82	25.07

Scenario A - Total Vehicle Hours of Delay (PM)	181.86

Scenario B and Future Traffic including Background Growth Only

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.2	256	34.9	402	24.0	371	17.4	808
Sackville St. - Dresden Row	0.0	982	4.9	503	227.5	63	-	-
Sackville St. - Queen St.	0.0	719	3.6	550	37.9	120	-	-
Sackville St. - Brunswick St.	12.5	610	27.9	75	19.4	195	206.0	979
Artillery Pl. - Dresden Row	-	-	9.3	13	0.0	47	0.8	199
Artillery Pl. - Birmingham St.	8.8	24	5.8	105	9.9	55	6.2	373
Doyle St. - Queen St.	-	-	11.9	63	0.0	101	0.6	278
Doyle St. - Brunswick St.	9.8	16	-	-	0.0	72	0.0	156
Spring Garden Rd. - South Park St.	20.6	365	14.8	276	20.3	491	11.4	514
Spring Garden Rd. - Brenton St..	0.0	361	0.9	241	-	-	-	-
Spring Garden Rd. - Dresden Row	11.3	301	9.3	213	15.1	40	18.7	148
Spring Garden Rd. - Birmingham St.	0.8	288	0.5	220	62.7	19	69.4	26
Spring Garden Rd. - Queen St.	7.7	298	12.9	372	22.1	230	25.9	262
Spring Garden Rd. - Brunswick St.	3.9	311	0.0	230	-	-	94.1	196
Brenton Pl. - South Park St.	-	-	17.5	76	0.0	421	0.0	484
Clyde St. - Brenton St.	-	-	10.6	46	7.5	4	0.0	65
Clyde St. - Dresden Row	-	-	10.3	54	1.7	41	1.6	86
Clyde St. - Birmingham St.	10.2	21	10.4	59	2.1	21	1.0	24
Clyde St. - Queen St.	21.8	20	-	-	0.5	226	2.0	389
Morris St. - South Park St.	20.2	429	16.4	265	11.7	500	12.2	501
Morris St. - Brenton St.	0.3	349	0.0	241	-	-	14.3	30
Morris St. - Dresden Row	0.9	357	0.0	227	-	-	13.8	25
Morris St. - Birmingham St.	0.2	317	0.0	244	-	-	13.6	32
Morris St. - Queen St.	19.7	326	13.1	223	15.3	224	20.3	335

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	B
Sackville St. - Dresden Row	A	A	F	-
Sackville St. - Queen St.	A	A	E	-
Sackville St. - Brunswick St.	B	C	B	F
Artillery Pl. - Dresden Row	-	A	A	A
Artillery Pl. - Birmingham St.	A	A	A	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	A	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	B	B
Spring Garden Rd. - Birmingham St.	A	A	F	F
Spring Garden Rd. - Queen St.	A	B	C	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	C	A	A
Clyde St. - Brenton St.	-	B	A	A
Clyde St. - Dresden Row	-	B	A	A
Clyde St. - Birmingham St.	B	B	A	A
Clyde St. - Queen St.	C	-	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	B
Morris St. - Queen St.	C	B	C	C

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.72	3.90	2.47	3.90	12.00
Sackville St. - Dresden Row	0.00	0.68	3.96	-	4.65
Sackville St. - Queen St.	0.00	0.55	1.26	-	1.81
Sackville St. - Brunswick St.	2.12	0.58	1.05	56.01	59.76
Artillery Pl. - Dresden Row	-	0.03	0.00	0.04	0.08
Artillery Pl. - Birmingham St.	0.06	0.17	0.15	0.64	1.02
Doyle St. - Queen St.	-	0.21	0.00	0.05	0.25
Doyle St. - Brunswick St.	0.04	-	0.00	0.00	0.04
Spring Garden Rd. - South Park St.	2.09	1.13	2.77	1.63	7.62
Spring Garden Rd. - Brenton St..	0.00	0.06	-	-	0.06
Spring Garden Rd. - Dresden Row	0.95	0.55	0.17	0.77	2.43
Spring Garden Rd. - Birmingham St.	0.06	0.03	0.33	0.50	0.92
Spring Garden Rd. - Queen St.	0.64	1.33	1.41	1.89	5.26
Spring Garden Rd. - Brunswick St.	0.34	0.00	-	5.12	5.46
Brenton Pl. - South Park St.	-	0.37	0.00	0.00	0.37
Clyde St. - Brenton St.	-	0.14	0.01	0.00	0.14
Clyde St. - Dresden Row	-	0.15	0.02	0.04	0.21
Clyde St. - Birmingham St.	0.06	0.17	0.01	0.01	0.25
Clyde St. - Queen St.	0.12	-	0.03	0.22	0.37
Morris St. - South Park St.	2.41	1.21	1.62	1.70	6.94
Morris St. - Brenton St.	0.03	0.00	-	0.12	0.15
Morris St. - Dresden Row	0.09	0.00	-	0.09	0.18
Morris St. - Birmingham St.	0.02	0.00	-	0.12	0.14
Morris St. - Queen St.	1.78	0.81	0.95	1.89	5.43

Scenario B - Total Vehicle Hours of Delay (AM)	115.56

Intersection Type: Signalized | Stop-Controlled

Legend

Level of Service: Acceptable | Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.7	237	30.3	701	16.9	740	15.7	512
Sackville St. - Dresden Row	0.0	530	1.9	579	215.9	222	-	-
Sackville St. - Queen St.	0.0	702	2.2	605	423.5	362	-	-
Sackville St. - Brunswick St.	30.3	763	31.0	200	32.4	403	83.9	665
Artillery Pl. - Dresden Row	-	-	13.5	50	0.0	133	1.6	231
Artillery Pl. - Birmingham St.	1.5	71	1.5	273	10.8	133	3.7	259
Doyle St. - Queen St.	-	-	15.2	56	0.0	330	2.1	170
Doyle St. - Brunswick St.	15.6	103	-	-	0.2	271	0.0	185
Spring Garden Rd. - South Park St.	23.8	347	22.5	367	22.0	722	9.2	426
Spring Garden Rd. - Brenton St..	0.0	444	2.2	371	-	-	-	-
Spring Garden Rd. - Dresden Row	17.0	315	11.7	319	17.7	129	20.5	149
Spring Garden Rd. - Birmingham St.	1.7	346	1.3	337	100.1	77	129.8	38
Spring Garden Rd. - Queen St.	12.9	361	17.3	408	27.3	545	18.0	162
Spring Garden Rd. - Brunswick St.	3.3	473	3.5	477	-	-	27.6	123
Brenton Pl. - South Park St.	-	-	95.4	305	0.0	530	0.0	276
Clyde St. - Brenton St.	-	-	13.2	142	7.6	48	0.0	105
Clyde St. - Dresden Row	-	-	13.0	141	1.1	69	1.5	139
Clyde St. - Birmingham St.	12.4	41	13.2	125	1.9	43	2.0	59
Clyde St. - Queen St.	36.1	48	-	-	1.1	464	0.1	268
Morris St. - South Park St.	22.7	409	20.4	557	15.4	709	11.0	315
Morris St. - Brenton St.	0.6	288	0.0	479	-	-	17.4	63
Morris St. - Dresden Row	1.6	325	0.0	449	-	-	18.2	49
Morris St. - Birmingham St.	1.3	268	0.0	442	-	-	16.9	39
Morris St. - Queen St.	62.6	290	82.7	514	87.8	344	41.2	246

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	B	B
Sackville St. - Dresden Row	A	A	F	-
Sackville St. - Queen St.	A	A	F	-
Sackville St. - Brunswick St.	C	C	C	F
Artillery Pl. - Dresden Row	-	B	A	A
Artillery Pl. - Birmingham St.	A	A	B	A
Doyle St. - Queen St.	-	C	A	A
Doyle St. - Brunswick St.	C	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	A
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	B	B	C
Spring Garden Rd. - Birmingham St.	A	A	F	F
Spring Garden Rd. - Queen St.	B	B	C	B
Spring Garden Rd. - Brunswick St.	A	A	-	D
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	-	B	A	A
Clyde St. - Dresden Row	-	B	A	A
Clyde St. - Birmingham St.	B	B	A	A
Clyde St. - Queen St.	E	-	A	A
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	F	F	F	E

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.63	5.90	3.48	2.23	13.24
Sackville St. - Dresden Row	0.00	0.31	13.30	-	13.61
Sackville St. - Queen St.	0.00	0.37	42.56	-	42.93
Sackville St. - Brunswick St.	6.42	1.73	3.63	15.50	27.28
Artillery Pl. - Dresden Row	-	0.19	0.00	0.10	0.29
Artillery Pl. - Birmingham St.	0.03	0.11	0.40	0.27	0.81
Doyle St. - Queen St.	-	0.24	0.00	0.10	0.34
Doyle St. - Brunswick St.	0.45	-	0.02	0.00	0.46
Spring Garden Rd. - South Park St.	2.30	2.30	4.41	1.09	10.09
Spring Garden Rd. - Brenton St..	0.00	0.23	-	-	0.23
Spring Garden Rd. - Dresden Row	1.49	1.04	0.63	0.85	4.01
Spring Garden Rd. - Birmingham St.	0.16	0.12	2.15	1.37	3.81
Spring Garden Rd. - Queen St.	1.29	1.96	4.14	0.81	8.20
Spring Garden Rd. - Brunswick St.	0.43	0.46	-	0.94	1.84
Brenton Pl. - South Park St.	-	8.07	0.00	0.00	8.07
Clyde St. - Brenton St.	-	0.52	0.10	0.00	0.62
Clyde St. - Dresden Row	-	0.51	0.02	0.06	0.59
Clyde St. - Birmingham St.	0.14	0.46	0.02	0.03	0.66
Clyde St. - Queen St.	0.48	-	0.14	0.01	0.63
Morris St. - South Park St.	2.58	3.15	3.03	0.96	9.73
Morris St. - Brenton St.	0.05	0.00	-	0.30	0.35
Morris St. - Dresden Row	0.14	0.00	-	0.25	0.39
Morris St. - Birmingham St.	0.10	0.00	-	0.18	0.28
Morris St. - Queen St.	5.04	11.81	8.39	2.82	28.06

Scenario B - Total Vehicle Hours of Delay (PM)	176.51

Scenario C and Future Traffic including Background Growth Only

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.2	256	23.8	402	26.3	371	17.0	808
Sackville St. - Dresden Row	0.0	982	5.0	542	-	-	-	-
Sackville St. - Queen St.	15.2	738	5.3	550	31.6	202	-	-
Sackville St. - Brunswick St.	12.5	610	27.9	75	19.4	195	206.0	979
Artillery Pl. - Dresden Row	-	-	-	-	-	-	1.3	218
Artillery Pl. - Birmingham St.	0.8	35	0.3	123	3.6	134	4.0	277
Doyle St. - Queen St.	-	-	12.9	63	0.0	102	0.0	386
Doyle St. - Brunswick St.	-	-	-	-	1.4	103	0.0	156
Spring Garden Rd. - South Park St.	20.6	365	13.6	276	20.2	491	11.7	514
Spring Garden Rd. - Brenton St..	0.0	354	0.8	237	-	-	-	-
Spring Garden Rd. - Dresden Row	10.4	295	9.5	217	-	-	16.3	148
Spring Garden Rd. - Birmingham St.	0.7	271	0.0	334	42.2	48	-	-
Spring Garden Rd. - Queen St.	7.7	292	12.3	358	23.1	255	40.3	388
Spring Garden Rd. - Brunswick St.	4.9	343	0.0	230	-	-	123.5	196
Brenton Pl. - South Park St.	-	-	19.7	80	0.0	421	0.3	494
Clyde St. - Brenton St.	10.6	7	11.1	49	7.8	4	0.0	65
Clyde St. - Dresden Row	11.3	7	11.5	21	4.1	24	1.4	97
Clyde St. - Birmingham St.	10.2	32	9.6	53	1.6	27	-	-
Clyde St. - Queen St.	22.9	17	-	-	0.5	252	2.0	401
Morris St. - South Park St.	20.2	429	16.4	265	11.7	500	12.1	501
Morris St. - Brenton St.	0.3	349	0.0	241	-	-	14.2	30
Morris St. - Dresden Row	0.7	383	0.0	216	-	-	13.2	36
Morris St. - Birmingham St.	0.4	348	0.0	244	-	-	15.3	19
Morris St. - Queen St.	22.3	361	13.4	236	15.8	252	21.4	355

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	B
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	C	A	D	-
Sackville St. - Brunswick St.	B	C	B	F
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	A	A	A	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	-	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	-	B
Spring Garden Rd. - Birmingham St.	A	A	E	-
Spring Garden Rd. - Queen St.	A	B	C	D
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	C	A	A
Clyde St. - Brenton St.	B	B	A	A
Clyde St. - Dresden Row	B	B	A	A
Clyde St. - Birmingham St.	B	A	A	-
Clyde St. - Queen St.	C	-	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	C	B	C	C

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.72	2.66	2.71	3.81	10.90
Sackville St. - Dresden Row	0.00	0.75	-	-	0.75
Sackville St. - Queen St.	3.12	0.81	1.77	-	5.70
Sackville St. - Brunswick St.	2.12	0.58	1.05	56.01	59.76
Artillery Pl. - Dresden Row	-	-	-	0.08	0.08
Artillery Pl. - Birmingham St.	0.01	0.01	0.13	0.31	0.46
Doyle St. - Queen St.	-	0.22	0.00	0.00	0.22
Doyle St. - Brunswick St.	-	-	0.04	0.00	0.04
Spring Garden Rd. - South Park St.	2.09	1.04	2.75	1.67	7.55
Spring Garden Rd. - Brenton St..	0.00	0.05	-	-	0.05
Spring Garden Rd. - Dresden Row	0.85	0.57	-	0.67	2.09
Spring Garden Rd. - Birmingham St.	0.05	0.00	0.56	-	0.62
Spring Garden Rd. - Queen St.	0.63	1.22	1.64	4.34	7.83
Spring Garden Rd. - Brunswick St.	0.47	0.00	-	6.72	7.19
Brenton Pl. - South Park St.	-	0.44	0.00	0.04	0.48
Clyde St. - Brenton St.	0.02	0.15	0.01	0.00	0.18
Clyde St. - Dresden Row	0.02	0.07	0.03	0.04	0.15
Clyde St. - Birmingham St.	0.09	0.14	0.01	-	0.24
Clyde St. - Queen St.	0.11	-	0.04	0.22	0.36
Morris St. - South Park St.	2.41	1.21	1.62	1.68	6.92
Morris St. - Brenton St.	0.03	0.00	-	0.12	0.15
Morris St. - Dresden Row	0.07	0.00	-	0.13	0.21
Morris St. - Birmingham St.	0.04	0.00	-	0.08	0.12
Morris St. - Queen St.	2.23	0.88	1.11	2.11	6.33

Scenario C - Total Vehicle Hours of Delay (AM)	118.40

Intersection Type: Signalized | Stop-Controlled

Legend

Level of Service: Acceptable | Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.7	237	21.9	701	17.1	740	15.7	512
Sackville St. - Dresden Row	0.0	530	2.3	654	-	-	-	-
Sackville St. - Queen St.	22.6	724	16.3	605	30.9	573	-	-
Sackville St. - Brunswick St.	30.3	763	31.0	200	32.4	403	83.9	665
Artillery Pl. - Dresden Row	-	-	-	-	-	-	3.6	361
Artillery Pl. - Birmingham St.	0.9	245	0.9	258	18.9	199	8.0	118
Doyle St. - Queen St.	-	-	13.6	56	0.0	289	0.0	253
Doyle St. - Brunswick St.	-	-	-	-	1.2	392	0.0	185
Spring Garden Rd. - South Park St.	25.7	347	21.5	339	20.8	750	8.3	426
Spring Garden Rd. - Brenton St..	0.0	429	1.3	343	-	-	-	-
Spring Garden Rd. - Dresden Row	14.8	300	10.5	334	-	-	19.5	149
Spring Garden Rd. - Birmingham St.	0.6	312	0.0	439	312.1	131	-	-
Spring Garden Rd. - Queen St.	12.5	358	17.0	388	38.8	597	29.3	282
Spring Garden Rd. - Brunswick St.	8.1	594	4.6	477	-	0	63.2	123
Brenton Pl. - South Park St.	-	-	240.1	333	0.0	530	0.8	291
Clyde St. - Brenton St.	11.1	15	14.2	170	7.7	48	0.0	105
Clyde St. - Dresden Row	12.5	15	14.3	86	5.7	54	1.3	158
Clyde St. - Birmingham St.	12.7	64	11.7	131	1.4	54	-	-
Clyde St. - Queen St.	49.6	34	-	-	1.0	515	0.1	255
Morris St. - South Park St.	22.7	409	20.4	557	15.4	709	10.7	315
Morris St. - Brenton St.	0.6	288	0.0	479	-	-	17.4	63
Morris St. - Dresden Row	1.1	376	0.0	430	-	-	17.9	68
Morris St. - Birmingham St.	1.6	330	0.0	442	-	-	23.9	53
Morris St. - Queen St.	132.3	479	58.4	582	81.0	421	30.9	262

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	B	B
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	C	C	D	-
Sackville St. - Brunswick St.	C	C	C	F
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	A	A	C	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	-	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	A
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	B	-	B
Spring Garden Rd. - Birmingham St.	A	A	F	-
Spring Garden Rd. - Queen St.	B	B	D	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	B	B	A	A
Clyde St. - Dresden Row	B	B	A	A
Clyde St. - Birmingham St.	B	B	A	-
Clyde St. - Queen St.	E	-	A	A
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	F	F	F	D

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.63	4.27	3.52	2.23	11.64
Sackville St. - Dresden Row	0.00	0.42	-	-	0.42
Sackville St. - Queen St.	4.54	2.74	4.92	-	12.20
Sackville St. - Brunswick St.	6.42	1.73	3.63	15.50	27.28
Artillery Pl. - Dresden Row	-	-	-	0.36	0.36
Artillery Pl. - Birmingham St.	0.06	0.06	1.05	0.26	1.43
Doyle St. - Queen St.	-	0.21	0.00	0.00	0.21
Doyle St. - Brunswick St.	-	-	0.13	0.00	0.13
Spring Garden Rd. - South Park St.	2.48	2.03	4.34	0.98	9.82
Spring Garden Rd. - Brenton St..	0.00	0.12	-	-	0.12
Spring Garden Rd. - Dresden Row	1.23	0.97	-	0.81	3.01
Spring Garden Rd. - Birmingham St.	0.05	0.00	11.36	-	11.41
Spring Garden Rd. - Queen St.	1.24	1.83	6.43	2.30	11.81
Spring Garden Rd. - Brunswick St.	1.34	0.61	-	2.16	4.11
Brenton Pl. - South Park St.	-	22.19	0.00	0.06	22.25
Clyde St. - Brenton St.	0.04	0.67	0.10	0.00	0.82
Clyde St. - Dresden Row	0.05	0.34	0.09	0.06	0.54
Clyde St. - Birmingham St.	0.23	0.43	0.02	-	0.67
Clyde St. - Queen St.	0.46	-	0.14	0.01	0.61
Morris St. - South Park St.	2.58	3.15	3.03	0.94	9.70
Morris St. - Brenton St.	0.05	0.00	-	0.30	0.35
Morris St. - Dresden Row	0.11	0.00	-	0.34	0.45
Morris St. - Birmingham St.	0.15	0.00	-	0.35	0.50
Morris St. - Queen St.	17.62	9.45	9.48	2.25	38.79

Scenario C - Total Vehicle Hours of Delay (PM)	168.65

Scenario D and Future Traffic including Background Growth Only

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	23.2	256	24.1	402	23.1	371	19.9	808
Sackville St. - Dresden Row	0.0	843	5.0	542	-	-	-	-
Sackville St. - Queen St.	14.1	738	7.7	550	31.9	202	-	-
Sackville St. - Brunswick St.	12.5	610	27.9	75	19.4	195	206.0	979
Artillery Pl. - Dresden Row	-	-	-	-	-	-	1.3	218
Artillery Pl. - Birmingham St.	0.8	25	0.4	125	4.3	142	4.2	242
Doyle St. - Queen St.	-	-	12.9	63	0.0	102	0.0	386
Doyle St. - Brunswick St.	-	-	-	-	1.4	103	0.0	156
Spring Garden Rd. - South Park St.	18.8	365	14.0	272	21.5	494	12.5	514
Spring Garden Rd. - Brenton St..	0.0	354	1.3	251	-	-	-	-
Spring Garden Rd. - Dresden Row	6.6	295	6.3	206	-	-	24.8	148
Spring Garden Rd. - Birmingham St.	1.0	271	0.0	323	36.5	48	-	-
Spring Garden Rd. - Queen St.	7.7	292	12.4	358	23.1	255	39.2	388
Spring Garden Rd. - Brunswick St.	4.9	343	0.0	230	-	-	123.5	196
Brenton Pl. - South Park St.	-	-	19.8	80	0.0	421	0.3	494
Clyde St. - Brenton St.	10.7	7	11.2	49	7.8	4	0.0	78
Clyde St. - Dresden Row	11.1	7	11.1	21	3.6	24	1.9	73
Clyde St. - Birmingham St.	10.2	32	9.6	53	1.6	27	-	-
Clyde St. - Queen St.	23.3	17	-	-	0.5	252	2.0	412
Morris St. - South Park St.	21.9	429	16.4	265	11.7	500	11.7	501
Morris St. - Brenton St.	0.3	349	0.0	227	-	-	13.2	44
Morris St. - Dresden Row	0.7	383	0.0	227	-	-	16.3	11
Morris St. - Birmingham St.	0.5	348	0.0	255	-	-	14.7	19
Morris St. - Queen St.	22.8	349	13.6	223	16.0	224	22.5	348

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	B
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	B	A	C	-
Sackville St. - Brunswick St.	B	C	B	F
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	A	A	A	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	-	-	A	A
Spring Garden Rd. - South Park St.	B	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	A	A	-	C
Spring Garden Rd. - Birmingham St.	A	A	E	-
Spring Garden Rd. - Queen St.	A	B	C	D
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	C	A	A
Clyde St. - Brenton St.	B	B	A	A
Clyde St. - Dresden Row	B	B	A	A
Clyde St. - Birmingham St.	B	A	A	-
Clyde St. - Queen St.	C	-	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	B
Morris St. - Queen St.	C	B	C	C

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.65	2.69	2.38	4.46	11.19
Sackville St. - Dresden Row	0.00	0.75	-	-	0.75
Sackville St. - Queen St.	2.89	1.18	1.79	-	5.85
Sackville St. - Brunswick St.	2.12	0.58	1.05	56.01	59.76
Artillery Pl. - Dresden Row	-	-	-	0.08	0.08
Artillery Pl. - Birmingham St.	0.01	0.01	0.17	0.28	0.47
Doyle St. - Queen St.	-	0.22	0.00	0.00	0.22
Doyle St. - Brunswick St.	-	-	0.04	0.00	0.04
Spring Garden Rd. - South Park St.	1.91	1.06	2.95	1.79	7.70
Spring Garden Rd. - Brenton St..	0.00	0.09	-	-	0.09
Spring Garden Rd. - Dresden Row	0.54	0.36	-	1.02	1.92
Spring Garden Rd. - Birmingham St.	0.08	0.00	0.49	-	0.56
Spring Garden Rd. - Queen St.	0.63	1.23	1.64	4.22	7.72
Spring Garden Rd. - Brunswick St.	0.47	0.00	-	6.72	7.19
Brenton Pl. - South Park St.	-	0.44	0.00	0.04	0.48
Clyde St. - Brenton St.	0.02	0.15	0.01	0.00	0.18
Clyde St. - Dresden Row	0.02	0.07	0.02	0.04	0.15
Clyde St. - Birmingham St.	0.09	0.14	0.01	-	0.24
Clyde St. - Queen St.	0.11	-	0.04	0.23	0.37
Morris St. - South Park St.	2.61	1.21	1.62	1.63	7.07
Morris St. - Brenton St.	0.03	0.00	-	0.16	0.19
Morris St. - Dresden Row	0.07	0.00	-	0.05	0.13
Morris St. - Birmingham St.	0.05	0.00	-	0.08	0.13
Morris St. - Queen St.	2.21	0.84	1.00	2.18	6.23

Scenario D - Total Vehicle Hours of Delay (AM)	118.72

Intersection Type: Signalized | Stop-Controlled

Legend

Level of Service: Acceptable | Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	20.0	237	17.3	701	27.5	740	31.1	512
Sackville St. - Dresden Row	0.0	530	2.3	654	-	-	-	-
Sackville St. - Queen St.	17.9	724	10.8	605	35.1	573	-	-
Sackville St. - Brunswick St.	30.3	763	31.0	200	32.4	403	83.9	665
Artillery Pl. - Dresden Row	-	-	-	-	-	-	3.6	361
Artillery Pl. - Birmingham St.	1.1	128	1.2	276	16.4	177	5.7	234
Doyle St. - Queen St.	-	-	13.6	56	0.0	289	0.0	253
Doyle St. - Brunswick St.	-	-	-	-	1.2	392	0.0	185
Spring Garden Rd. - South Park St.	18.8	347	15.6	339	32.0	750	13.8	426
Spring Garden Rd. - Brenton St..	0.0	429	3.3	363	-	-	-	-
Spring Garden Rd. - Dresden Row	10.3	300	6.5	315	-	-	29.4	149
Spring Garden Rd. - Birmingham St.	1.0	312	0.0	420	157.7	131	-	-
Spring Garden Rd. - Queen St.	9.8	358	17.5	388	38.8	597	30.8	282
Spring Garden Rd. - Brunswick St.	7.7	594	3.9	477	-	-	65.8	123
Brenton Pl. - South Park St.	-	-	234.5	333	0.0	530	0.8	291
Clyde St. - Brenton St.	11.3	15	14.6	170	7.7	48	0.0	125
Clyde St. - Dresden Row	12.1	15	13.6	86	4.9	54	1.7	119
Clyde St. - Birmingham St.	12.6	64	11.7	131	1.4	54	-	-
Clyde St. - Queen St.	52.0	34	-	-	1.1	515	0.1	274
Morris St. - South Park St.	21.4	409	19.4	557	16.2	709	10.2	315
Morris St. - Brenton St.	0.6	288	0.0	459	-	-	17.0	83
Morris St. - Dresden Row	1.1	376	0.0	449	-	-	18.7	29
Morris St. - Birmingham St.	1.6	330	0.0	461	-	-	24.1	53
Morris St. - Queen St.	139.9	479	61.3	582	86.4	421	35.2	284

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	B	C	C
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	B	B	D	-
Sackville St. - Brunswick St.	C	C	C	F
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	A	A	C	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	-	-	A	A
Spring Garden Rd. - South Park St.	B	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	-	C
Spring Garden Rd. - Birmingham St.	A	A	F	-
Spring Garden Rd. - Queen St.	A	B	D	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	B	B	A	A
Clyde St. - Dresden Row	B	B	A	A
Clyde St. - Birmingham St.	B	B	A	-
Clyde St. - Queen St.	F	-	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	F	F	F	E

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.32	3.37	5.66	4.42	14.77
Sackville St. - Dresden Row	0.00	0.42	-	-	0.42
Sackville St. - Queen St.	3.60	1.81	5.59	-	11.00
Sackville St. - Brunswick St.	6.42	1.73	3.63	15.50	27.28
Artillery Pl. - Dresden Row	-	-	-	0.36	0.36
Artillery Pl. - Birmingham St.	0.04	0.09	0.81	0.37	1.31
Doyle St. - Queen St.	-	0.21	0.00	0.00	0.21
Doyle St. - Brunswick St.	-	-	0.13	0.00	0.13
Spring Garden Rd. - South Park St.	1.81	1.47	6.67	1.63	11.59
Spring Garden Rd. - Brenton St..	0.00	0.33	-	-	0.33
Spring Garden Rd. - Dresden Row	0.86	0.57	-	1.22	2.64
Spring Garden Rd. - Birmingham St.	0.09	0.00	5.74	-	5.83
Spring Garden Rd. - Queen St.	0.98	1.88	6.43	2.41	11.71
Spring Garden Rd. - Brunswick St.	1.27	0.52	-	2.25	4.04
Brenton Pl. - South Park St.	-	21.67	0.00	0.06	21.73
Clyde St. - Brenton St.	0.05	0.69	0.10	0.00	0.84
Clyde St. - Dresden Row	0.05	0.33	0.07	0.06	0.50
Clyde St. - Birmingham St.	0.22	0.43	0.02	-	0.67
Clyde St. - Queen St.	0.49	-	0.16	0.01	0.65
Morris St. - South Park St.	2.43	3.00	3.19	0.89	9.51
Morris St. - Brenton St.	0.05	0.00	-	0.39	0.44
Morris St. - Dresden Row	0.11	0.00	-	0.15	0.27
Morris St. - Birmingham St.	0.15	0.00	-	0.35	0.50
Morris St. - Queen St.	18.63	9.92	10.11	2.78	41.43

Scenario D - Total Vehicle Hours of Delay (PM)	168.16

Future Scenarios with background growth and development

Scenario A and Future Traffic including Background Growth and Development Traffic

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.6	268	36.8	415	26.1	389	21.3	845
Sackville St. - Dresden Row	0.0	1022	5.5	517	376.6	86	-	351
Sackville St. - Queen St.	0.0	760	4.5	576	70.0	139	-	-
Sackville St. - Brunswick St.	25.9	646	31.9	77	12.2	199	69.0	1013
Artillery Pl. - Dresden Row	-	-	9.5	13	0.0	70	0.7	218
Artillery Pl. - Birmingham St.	7.1	24	2.3	116	8.9	36	2.0	415
Doyle St. - Queen St.	-	-	12.3	63	0.0	110	0.5	305
Doyle St. - Brunswick St.	9.9	17	-	-	0.0	78	0.0	163
Spring Garden Rd. - South Park St.	21.9	382	16.2	291	21.3	526	11.1	526
Spring Garden Rd. - Brenton St..	0.0	400	1.0	260	-	-	-	-
Spring Garden Rd. - Dresden Row	10.8	336	9.2	240	16.4	50	20.2	166
Spring Garden Rd. - Birmingham St.	1.8	303	1.9	242	25.4	28	7.4	46
Spring Garden Rd. - Queen St.	8.3	303	12.9	375	24.1	273	26.6	289
Spring Garden Rd. - Brunswick St.	4.1	325	0.0	240	-	-	134.2	211
Brenton Pl. - South Park St.	-	-	19.6	126	0.0	425	0.0	488
Clyde St. - Brenton St.	-	-	11.1	87	7.6	6	0.0	72
Clyde St. - Dresden Row	-	-	11.6	95	1.5	48	2.6	106
Clyde St. - Birmingham St.	10.8	62	10.9	86	2.1	25	1.6	44
Clyde St. - Queen St.	44.2	47	37.8	61	0.7	255	3.3	449
Morris St. - South Park St.	20.7	440	16.7	279	12.2	518	12.8	523
Morris St. - Brenton St.	0.3	372	0.0	252	-	-	14.6	32
Morris St. - Dresden Row	1.0	379	0.0	233	-	-	13.7	31
Morris St. - Birmingham St.	0.2	334	0.0	248	-	-	14.6	43
Morris St. - Queen St.	24.4	348	14.3	232	17.1	231	25.9	364

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	D	C	C
Sackville St. - Dresden Row	A	A	F	-
Sackville St. - Queen St.	A	A	F	-
Sackville St. - Brunswick St.	C	C	B	E
Artillery Pl. - Dresden Row	-	A	A	A
Artillery Pl. - Birmingham St.	A	A	A	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	A	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	B	C
Spring Garden Rd. - Birmingham St.	A	A	D	A
Spring Garden Rd. - Queen St.	A	B	C	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	C	A	A
Clyde St. - Brenton St.	-	B	A	A
Clyde St. - Dresden Row	-	B	A	A
Clyde St. - Birmingham St.	B	B	A	A
Clyde St. - Queen St.	E	E	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	B
Morris St. - Queen St.	C	B	C	D

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.83	4.24	2.82	5.00	13.89
Sackville St. - Dresden Row	0.00	0.79	9.00	-	9.79
Sackville St. - Queen St.	0.00	0.72	2.70	-	3.42
Sackville St. - Brunswick St.	4.65	0.68	0.67	19.42	25.42
Artillery Pl. - Dresden Row	-	0.03	0.00	0.04	0.08
Artillery Pl. - Birmingham St.	0.05	0.07	0.09	0.23	0.44
Doyle St. - Queen St.	-	0.22	0.00	0.04	0.26
Doyle St. - Brunswick St.	0.05	-	0.00	0.00	0.05
Spring Garden Rd. - South Park St.	2.32	1.31	3.11	1.62	8.37
Spring Garden Rd. - Brenton St..	0.00	0.07	-	-	0.07
Spring Garden Rd. - Dresden Row	1.01	0.61	0.23	0.93	2.78
Spring Garden Rd. - Birmingham St.	0.15	0.13	0.20	0.09	0.57
Spring Garden Rd. - Queen St.	0.70	1.34	1.83	2.14	6.01
Spring Garden Rd. - Brunswick St.	0.37	0.00	-	7.87	8.24
Brenton Pl. - South Park St.	-	0.69	0.00	0.00	0.69
Clyde St. - Brenton St.	-	0.27	0.01	0.00	0.28
Clyde St. - Dresden Row	-	0.31	0.02	0.08	0.40
Clyde St. - Birmingham St.	0.19	0.26	0.01	0.02	0.48
Clyde St. - Queen St.	0.58	0.64	0.05	0.41	1.68
Morris St. - South Park St.	2.53	1.29	1.76	1.86	7.44
Morris St. - Brenton St.	0.03	0.00	-	0.13	0.16
Morris St. - Dresden Row	0.11	0.00	-	0.12	0.22
Morris St. - Birmingham St.	0.02	0.00	-	0.17	0.19
Morris St. - Queen St.	2.36	0.92	1.10	2.62	7.00

Scenario A - Total Vehicle Hours of Delay (AM)	97.92

Intersection Type: Signalized | Stop-Controlled

Legend

Level of Service: Acceptable | Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	26.7	261	39.3	730	21.9	839	32.8	564
Sackville St. - Dresden Row	0.0	581	2.1	614	383.6	254	-	-
Sackville St. - Queen St.	0.0	821	2.6	667	800.0	387	-	-
Sackville St. - Brunswick St.	58.1	848	43.6	214	32.7	441	99.0	724
Artillery Pl. - Dresden Row	-	-	14.1	51	0.0	165	1.6	244
Artillery Pl. - Birmingham St.	8.8	64	1.9	335	18.7	154	2.0	365
Doyle St. - Queen St.	-	-	17.2	58	0.0	383	1.7	239
Doyle St. - Brunswick St.	16.3	104	-	-	0.1	294	0.0	204
Spring Garden Rd. - South Park St.	27.0	383	31.6	421	27.7	813	11.7	453
Spring Garden Rd. - Brenton St..	0.0	511	2.5	435	-	-	-	-
Spring Garden Rd. - Dresden Row	13.8	373	9.8	401	21.7	145	25.6	162
Spring Garden Rd. - Birmingham St.	4.1	378	3.1	422	38.8	98	32.0	61
Spring Garden Rd. - Queen St.	12.5	385	27.5	465	55.1	734	18.3	232
Spring Garden Rd. - Brunswick St.	11.2	555	0.0	526	-	-	861.0	159
Brenton Pl. - South Park St.	-	-	196.0	404	0.0	536	0.0	284
Clyde St. - Brenton St.	-	-	16.0	233	7.6	52	0.0	111
Clyde St. - Dresden Row	-	-	17.4	227	1.0	90	2.0	162
Clyde St. - Birmingham St.	14.8	77	17.1	211	2.2	61	2.3	91
Clyde St. - Queen St.	800.0	107	800.0	289	1.5	573	5.2	409
Morris St. - South Park St.	24.5	440	21.8	601	17.5	769	11.9	350
Morris St. - Brenton St.	0.7	376	0.0	534	-	-	20.2	68
Morris St. - Dresden Row	0.2	351	0.0	499	-	-	19.2	58
Morris St. - Birmingham St.	1.6	335	0.0	491	-	-	18.5	48
Morris St. - Queen St.	139.1	348	83.2	563	148.8	375	77.9	300

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	D	C	C
Sackville St. - Dresden Row	A	A	F	-
Sackville St. - Queen St.	A	A	F	-
Sackville St. - Brunswick St.	E	D	C	F
Artillery Pl. - Dresden Row	-	B	A	A
Artillery Pl. - Birmingham St.	A	A	C	A
Doyle St. - Queen St.	-	C	A	A
Doyle St. - Brunswick St.	C	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	C	C
Spring Garden Rd. - Birmingham St.	A	A	E	D
Spring Garden Rd. - Queen St.	B	C	E	B
Spring Garden Rd. - Brunswick St.	B	A	-	F
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	-	C	A	A
Clyde St. - Dresden Row	-	C	A	A
Clyde St. - Birmingham St.	B	C	A	A
Clyde St. - Queen St.	F	F	A	A
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	F	F	F	F

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.94	7.97	5.10	5.14	20.15
Sackville St. - Dresden Row	0.00	0.36	27.07	-	27.42
Sackville St. - Queen St.	0.00	0.48	86.00	-	86.48
Sackville St. - Brunswick St.	13.69	2.59	4.01	19.91	40.19
Artillery Pl. - Dresden Row	-	0.20	0.00	0.11	0.31
Artillery Pl. - Birmingham St.	0.16	0.18	0.80	0.20	1.34
Doyle St. - Queen St.	-	0.28	0.00	0.11	0.39
Doyle St. - Brunswick St.	0.47	-	0.01	0.00	0.48
Spring Garden Rd. - South Park St.	2.87	3.70	6.26	1.47	14.30
Spring Garden Rd. - Brenton St..	0.00	0.30	-	-	0.30
Spring Garden Rd. - Dresden Row	1.43	1.09	0.87	1.15	4.55
Spring Garden Rd. - Birmingham St.	0.43	0.36	1.06	0.54	2.39
Spring Garden Rd. - Queen St.	1.34	3.55	11.23	1.18	17.30
Spring Garden Rd. - Brunswick St.	1.73	0.00	-	38.03	39.75
Brenton Pl. - South Park St.	-	22.00	0.00	0.00	22.00
Clyde St. - Brenton St.	-	1.04	0.11	0.00	1.15
Clyde St. - Dresden Row	-	1.10	0.03	0.09	1.21
Clyde St. - Birmingham St.	0.32	1.00	0.04	0.06	1.41
Clyde St. - Queen St.	23.78	64.22	0.24	0.59	88.83
Morris St. - South Park St.	2.99	3.64	3.74	1.16	11.53
Morris St. - Brenton St.	0.07	0.00	-	0.38	0.45
Morris St. - Dresden Row	0.02	0.00	-	0.31	0.33
Morris St. - Birmingham St.	0.15	0.00	-	0.25	0.40
Morris St. - Queen St.	13.45	13.01	15.50	6.49	48.45

800.0 An arbitrary delay of 800 seconds was used where the volume to capacity ratios were too high for realistic delay calculations.

Scenario A - Total Vehicle Hours of Delay (PM)	431.11

Scenario B and Future Traffic including Background Growth and Development Traffic

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.6	268	36.8	415	26.2	389	21.3	845
Sackville St. - Dresden Row	0.0	1018	5.5	517	340.3	67	-	-
Sackville St. - Queen St.	0.0	741	4.4	576	61.8	158	-	-
Sackville St. - Brunswick St.	25.9	646	31.9	77	12.2	199	69.0	1013
Artillery Pl. - Dresden Row	-	-	9.4	13	0.0	51	0.7	218
Artillery Pl. - Birmingham St.	11.5	24	1.4	135	10.7	36	1.8	418
Doyle St. - Queen St.	-	-	12.5	63	0.0	129	0.5	305
Doyle St. - Brunswick St.	9.9	17	-	-	0.0	78	0.0	163
Spring Garden Rd. - South Park St.	21.9	382	16.2	291	21.3	526	11.1	526
Spring Garden Rd. - Brenton St..	0.0	399	1.0	260	-	-	-	-
Spring Garden Rd. - Dresden Row	11.4	336	9.3	227	16.4	50	20.2	166
Spring Garden Rd. - Birmingham St.	2.2	322	2.0	228	17.4	28	7.0	46
Spring Garden Rd. - Queen St.	10.2	322	13.3	388	24.1	273	26.7	289
Spring Garden Rd. - Brunswick St.	4.1	325	0.0	240	-	-	134.2	211
Brenton Pl. - South Park St.	-	-	19.6	126	0.0	425	0.0	488
Clyde St. - Brenton St.	-	-	11.1	87	7.6	6	0.0	72
Clyde St. - Dresden Row	-	-	11.5	109	1.5	48	2.6	106
Clyde St. - Birmingham St.	10.9	62	11.1	100	2.1	25	1.6	44
Clyde St. - Queen St.	45.0	47	38.4	61	0.7	255	3.2	462
Morris St. - South Park St.	22.4	440	16.7	279	12.0	518	12.8	523
Morris St. - Brenton St.	0.3	372	0.0	252	-	-	14.6	32
Morris St. - Dresden Row	1.0	379	0.0	233	-	-	13.7	31
Morris St. - Birmingham St.	0.2	334	0.0	248	-	-	14.6	43
Morris St. - Queen St.	24.4	348	14.3	232	17.1	231	25.9	364

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	D	C	C
Sackville St. - Dresden Row	A	A	F	-
Sackville St. - Queen St.	A	A	F	-
Sackville St. - Brunswick St.	C	C	B	E
Artillery Pl. - Dresden Row	-	A	A	A
Artillery Pl. - Birmingham St.	B	A	B	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	A	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	B	C
Spring Garden Rd. - Birmingham St.	A	A	C	A
Spring Garden Rd. - Queen St.	B	B	C	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	C	A	A
Clyde St. - Brenton St.	-	B	A	A
Clyde St. - Dresden Row	-	B	A	A
Clyde St. - Birmingham St.	B	B	A	A
Clyde St. - Queen St.	E	E	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	B
Morris St. - Queen St.	C	B	C	D

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.83	4.24	2.83	5.00	13.90
Sackville St. - Dresden Row	0.00	0.79	6.33	-	7.12
Sackville St. - Queen St.	0.00	0.70	2.71	-	3.42
Sackville St. - Brunswick St.	4.65	0.68	0.67	19.42	25.42
Artillery Pl. - Dresden Row	-	0.03	0.00	0.04	0.08
Artillery Pl. - Birmingham St.	0.08	0.05	0.11	0.21	0.45
Doyle St. - Queen St.	-	0.22	0.00	0.04	0.26
Doyle St. - Brunswick St.	0.05	-	0.00	0.00	0.05
Spring Garden Rd. - South Park St.	2.32	1.31	3.11	1.62	8.37
Spring Garden Rd. - Brenton St..	0.00	0.07	-	-	0.07
Spring Garden Rd. - Dresden Row	1.06	0.59	0.23	0.93	2.81
Spring Garden Rd. - Birmingham St.	0.20	0.13	0.14	0.09	0.55
Spring Garden Rd. - Queen St.	0.91	1.43	1.83	2.14	6.32
Spring Garden Rd. - Brunswick St.	0.37	0.00	-	7.87	8.24
Brenton Pl. - South Park St.	-	0.69	0.00	0.00	0.69
Clyde St. - Brenton St.	-	0.27	0.01	0.00	0.28
Clyde St. - Dresden Row	-	0.35	0.02	0.08	0.44
Clyde St. - Birmingham St.	0.19	0.31	0.01	0.02	0.53
Clyde St. - Queen St.	0.59	0.65	0.05	0.41	1.70
Morris St. - South Park St.	2.74	1.29	1.73	1.86	7.62
Morris St. - Brenton St.	0.03	0.00	-	0.13	0.16
Morris St. - Dresden Row	0.11	0.00	-	0.12	0.22
Morris St. - Birmingham St.	0.02	0.00	-	0.17	0.19
Morris St. - Queen St.	2.36	0.92	1.10	2.62	7.00

Scenario B - Total Vehicle Hours of Delay (AM)	95.87

Intersection Type: Signalized | Stop-Controlled

Legend

Level of Service: Acceptable | Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	26.7	261	39.3	730	21.8	839	32.8	564
Sackville St. - Dresden Row	0.0	581	2.1	614	354.8	232	-	-
Sackville St. - Queen St.	0.0	799	2.5	667	800.0	408	-	-
Sackville St. - Brunswick St.	58.1	848	43.6	214	32.7	441	99.0	724
Artillery Pl. - Dresden Row	-	-	13.7	51	0.0	144	1.5	244
Artillery Pl. - Birmingham St.	8.9	64	1.8	356	20.1	154	1.8	365
Doyle St. - Queen St.	-	-	17.7	58	0.0	404	1.8	239
Doyle St. - Brunswick St.	18.1	104	-	-	0.2	294	0.0	204
Spring Garden Rd. - South Park St.	27.0	383	31.2	421	26.5	787	11.4	1238
Spring Garden Rd. - Brenton St..	0.0	507	2.5	435	-	-	-	-
Spring Garden Rd. - Dresden Row	14.7	373	10.2	378	21.1	145	25.5	162
Spring Garden Rd. - Birmingham St.	11.5	399	3.5	398	68.8	98	31.9	61
Spring Garden Rd. - Queen St.	17.0	406	31.9	488	55.1	734	17.8	232
Spring Garden Rd. - Brunswick St.	11.2	555	0.0	526	-	-	806.6	159
Brenton Pl. - South Park St.	-	-	196.0	404	0.0	536	0.0	284
Clyde St. - Brenton St.	-	-	16.0	233	7.6	52	0.0	111
Clyde St. - Dresden Row	-	-	17.8	250	1.0	90	2.0	162
Clyde St. - Birmingham St.	15.1	77	18.3	235	2.2	61	2.3	91
Clyde St. - Queen St.	800.0	107	800.0	289	1.5	573	5.1	432
Morris St. - South Park St.	24.4	440	21.8	601	17.6	769	11.9	380
Morris St. - Brenton St.	0.7	376	0.0	534	-	-	20.2	68
Morris St. - Dresden Row	2.1	409	0.0	499	-	-	21.8	58
Morris St. - Birmingham St.	1.6	335	0.0	491	-	-	18.5	48
Morris St. - Queen St.	139.1	348	83.2	563	148.8	375	77.9	300

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	D	C	C
Sackville St. - Dresden Row	A	A	F	-
Sackville St. - Queen St.	A	A	F	-
Sackville St. - Brunswick St.	E	D	C	F
Artillery Pl. - Dresden Row	-	B	A	A
Artillery Pl. - Birmingham St.	A	A	C	A
Doyle St. - Queen St.	-	C	A	A
Doyle St. - Brunswick St.	C	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	B	C	C
Spring Garden Rd. - Birmingham St.	B	A	F	D
Spring Garden Rd. - Queen St.	B	C	E	B
Spring Garden Rd. - Brunswick St.	B	A	-	F
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	-	C	A	A
Clyde St. - Dresden Row	-	C	A	A
Clyde St. - Birmingham St.	C	C	A	A
Clyde St. - Queen St.	F	F	A	A
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	F	F	F	F

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.94	7.97	5.08	5.14	20.12
Sackville St. - Dresden Row	0.00	0.36	22.86	-	23.22
Sackville St. - Queen St.	0.00	0.46	90.67	-	91.13
Sackville St. - Brunswick St.	13.69	2.59	4.01	19.91	40.19
Artillery Pl. - Dresden Row	-	0.19	0.00	0.10	0.30
Artillery Pl. - Birmingham St.	0.16	0.18	0.86	0.18	1.38
Doyle St. - Queen St.	-	0.29	0.00	0.12	0.40
Doyle St. - Brunswick St.	0.52	-	0.02	0.00	0.54
Spring Garden Rd. - South Park St.	2.87	3.65	5.79	3.92	16.23
Spring Garden Rd. - Brenton St..	0.00	0.30	-	-	0.30
Spring Garden Rd. - Dresden Row	1.52	1.07	0.85	1.15	4.59
Spring Garden Rd. - Birmingham St.	1.27	0.39	1.87	0.54	4.07
Spring Garden Rd. - Queen St.	1.92	4.32	11.23	1.15	18.62
Spring Garden Rd. - Brunswick St.	1.73	0.00	-	35.62	37.35
Brenton Pl. - South Park St.	-	22.00	0.00	0.00	22.00
Clyde St. - Brenton St.	-	1.04	0.11	0.00	1.15
Clyde St. - Dresden Row	-	1.24	0.03	0.09	1.35
Clyde St. - Birmingham St.	0.32	1.19	0.04	0.06	1.61
Clyde St. - Queen St.	23.78	64.22	0.24	0.61	88.85
Morris St. - South Park St.	2.98	3.64	3.76	1.26	11.64
Morris St. - Brenton St.	0.07	0.00	-	0.38	0.45
Morris St. - Dresden Row	0.24	0.00	-	0.35	0.59
Morris St. - Birmingham St.	0.15	0.00	-	0.25	0.40
Morris St. - Queen St.	13.45	13.01	15.50	6.49	48.45

800.0 An arbitrary delay of 800 seconds was used where the volume to capacity ratios were too high for realistic delay calculations.

Scenario B - Total Vehicle Hours of Delay (PM)	434.95

Scenario C and Future Traffic including Background Growth and Development Traffic

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.6	268	30.5	415	26.2	389	21.3	845
Sackville St. - Dresden Row	0.0	1018	5.6	556	-	-	-	-
Sackville St. - Queen St.	12.5	760	6.6	576	36.0	249	-	-
Sackville St. - Brunswick St.	25.9	646	31.9	77	12.2	199	69.0	1013
Artillery Pl. - Dresden Row	-	-	-	-	-	-	1.2	237
Artillery Pl. - Birmingham St.	8.0	32	0.5	150	5.9	84	1.3	405
Doyle St. - Queen St.	-	-	13.7	63	0.0	129	0.0	425
Doyle St. - Brunswick St.	-	-	-	-	1.3	111	0.0	163
Spring Garden Rd. - South Park St.	21.8	382	14.5	285	21.2	533	11.1	527
Spring Garden Rd. - Brenton St..	0.0	385	0.9	253	-	-	-	-
Spring Garden Rd. - Dresden Row	10.2	322	8.8	232	-	-	20.0	166
Spring Garden Rd. - Birmingham St.	1.8	295	2.0	339	16.5	69	-	-
Spring Garden Rd. - Queen St.	10.6	315	17.4	375	19.8	298	32.0	426
Spring Garden Rd. - Brunswick St.	5.1	357	0.0	240	-	-	177.5	211
Brenton Pl. - South Park St.	-	-	26.5	133	0.0	425	0.6	506
Clyde St. - Brenton St.	10.7	14	11.8	93	7.8	6	0.0	72
Clyde St. - Dresden Row	12.0	14	12.8	67	3.7	34	2.4	117
Clyde St. - Birmingham St.	10.9	81	10.3	105	1.7	32	-	-
Clyde St. - Queen St.	48.5	36	35.3	61	0.6	281	3.3	475
Morris St. - South Park St.	20.7	440	16.7	279	12.2	518	12.5	523
Morris St. - Brenton St.	0.3	372	0.0	252	-	-	14.5	32
Morris St. - Dresden Row	0.8	404	0.0	221	-	-	13.3	42
Morris St. - Birmingham St.	0.5	367	0.0	248	-	-	16.4	34
Morris St. - Queen St.	29.1	376	14.7	232	17.9	231	27.4	362

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	C
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	B	A	D	-
Sackville St. - Brunswick St.	C	C	B	E
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	A	A	A	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	-	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	-	C
Spring Garden Rd. - Birmingham St.	A	A	C	-
Spring Garden Rd. - Queen St.	B	B	B	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	D	A	A
Clyde St. - Brenton St.	B	B	A	A
Clyde St. - Dresden Row	B	B	A	A
Clyde St. - Birmingham St.	B	B	A	-
Clyde St. - Queen St.	E	E	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	D	B	C	D

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.83	3.52	2.83	5.00	13.18
Sackville St. - Dresden Row	0.00	0.86	-	-	0.86
Sackville St. - Queen St.	2.64	1.06	2.49	-	6.18
Sackville St. - Brunswick St.	4.65	0.68	0.67	19.42	25.42
Artillery Pl. - Dresden Row	-	-	-	0.08	0.08
Artillery Pl. - Birmingham St.	0.07	0.02	0.14	0.15	0.38
Doyle St. - Queen St.	-	0.24	0.00	0.00	0.24
Doyle St. - Brunswick St.	-	-	0.04	0.00	0.04
Spring Garden Rd. - South Park St.	2.31	1.15	3.14	1.62	8.22
Spring Garden Rd. - Brenton St..	0.00	0.06	-	-	0.06
Spring Garden Rd. - Dresden Row	0.91	0.57	-	0.92	2.40
Spring Garden Rd. - Birmingham St.	0.15	0.19	0.32	-	0.65
Spring Garden Rd. - Queen St.	0.93	1.81	1.64	3.79	8.17
Spring Garden Rd. - Brunswick St.	0.51	0.00	-	10.40	10.91
Brenton Pl. - South Park St.	-	0.98	0.00	0.08	1.06
Clyde St. - Brenton St.	0.04	0.30	0.01	0.00	0.36
Clyde St. - Dresden Row	0.05	0.24	0.03	0.08	0.40
Clyde St. - Birmingham St.	0.25	0.30	0.02	-	0.56
Clyde St. - Queen St.	0.49	0.60	0.05	0.44	1.57
Morris St. - South Park St.	2.53	1.29	1.76	1.82	7.40
Morris St. - Brenton St.	0.03	0.00	-	0.13	0.16
Morris St. - Dresden Row	0.09	0.00	-	0.16	0.24
Morris St. - Birmingham St.	0.05	0.00	-	0.15	0.21
Morris St. - Queen St.	3.04	0.95	1.15	2.76	7.89

Scenario C - Total Vehicle Hours of Delay (AM)	96.64

Intersection Type: Signalized | Stop-Controlled

Legend

Level of Service: Acceptable | Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	26.7	261	33.8	730	22.0	839	32.8	564
Sackville St. - Dresden Row	0.0	581	2.6	690	-	-	-	-
Sackville St. - Queen St.	22.2	821	10.8	668	40.8	637	-	-
Sackville St. - Brunswick St.	58.1	848	43.6	214	32.7	441	99.0	724
Artillery Pl. - Dresden Row	-	-	-	-	-	-	3.5	374
Artillery Pl. - Birmingham St.	35.2	138	0.8	397	66.2	230	7.7	340
Doyle St. - Queen St.	-	-	15.8	58	0.0	362	0.0	342
Doyle St. - Brunswick St.	-	-	-	-	1.2	416	0.0	204
Spring Garden Rd. - South Park St.	28.2	383	26.3	388	26.0	840	9.0	454
Spring Garden Rd. - Brenton St..	0.0	480	1.3	401	-	-	-	-
Spring Garden Rd. - Dresden Row	12.6	346	8.3	396	-	-	25.8	167
Spring Garden Rd. - Birmingham St.	6.6	351	3.2	504	77.8	172	-	-
Spring Garden Rd. - Queen St.	13.2	403	25.4	465	102.5	786	256.9	373
Spring Garden Rd. - Brunswick St.	40.1	677	0.0	526	-	-	800.0	159
Brenton Pl. - South Park St.	-	-	470.2	437	0.0	536	1.3	312
Clyde St. - Brenton St.	11.4	27	18.0	233	7.7	52	0.0	111
Clyde St. - Dresden Row	13.7	27	19.5	175	4.4	79	1.8	182
Clyde St. - Birmingham St.	16.4	112	14.7	254	1.8	74	-	-
Clyde St. - Queen St.	800.0	84	800.0	289	1.5	625	5.4	436
Morris St. - South Park St.	24.5	440	21.8	601	17.6	769	11.5	350
Morris St. - Brenton St.	0.7	376	0.0	534	-	-	20.2	68
Morris St. - Dresden Row	1.6	460	0.0	479	-	-	21.5	78
Morris St. - Birmingham St.	1.9	399	0.0	491	-	-	32.9	71
Morris St. - Queen St.	240.6	443	72.8	563	126.4	375	44.3	257

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	C
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	C	B	D	-
Sackville St. - Brunswick St.	E	D	C	F
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	E	A	F	A
Doyle St. - Queen St.	-	C	A	A
Doyle St. - Brunswick St.	-	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	A
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	-	C
Spring Garden Rd. - Birmingham St.	A	A	F	-
Spring Garden Rd. - Queen St.	B	C	F	F
Spring Garden Rd. - Brunswick St.	E	A	-	F
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	B	C	A	A
Clyde St. - Dresden Row	B	C	A	A
Clyde St. - Birmingham St.	C	B	A	-
Clyde St. - Queen St.	F	F	A	A
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	D
Morris St. - Queen St.	F	F	F	E

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.94	6.85	5.13	5.14	19.06
Sackville St. - Dresden Row	0.00	0.50	-	-	0.50
Sackville St. - Queen St.	5.06	2.00	7.22	-	14.29
Sackville St. - Brunswick St.	13.69	2.59	4.01	19.91	40.19
Artillery Pl. - Dresden Row	-	-	-	0.36	0.36
Artillery Pl. - Birmingham St.	1.35	0.09	4.23	0.73	6.39
Doyle St. - Queen St.	-	0.25	0.00	0.00	0.25
Doyle St. - Brunswick St.	-	-	0.14	0.00	0.14
Spring Garden Rd. - South Park St.	3.00	2.83	6.07	1.14	13.04
Spring Garden Rd. - Brenton St..	0.00	0.14	-	-	0.14
Spring Garden Rd. - Dresden Row	1.21	0.91	-	1.20	3.32
Spring Garden Rd. - Birmingham St.	0.64	0.45	3.72	-	4.81
Spring Garden Rd. - Queen St.	1.48	3.28	22.38	26.62	53.76
Spring Garden Rd. - Brunswick St.	7.54	0.00	-	35.33	42.87
Brenton Pl. - South Park St.	-	57.08	0.00	0.11	57.19
Clyde St. - Brenton St.	0.09	1.17	0.11	0.00	1.36
Clyde St. - Dresden Row	0.10	0.95	0.10	0.09	1.24
Clyde St. - Birmingham St.	0.51	1.04	0.04	-	1.58
Clyde St. - Queen St.	18.67	64.22	0.26	0.65	83.80
Morris St. - South Park St.	2.99	3.64	3.76	1.12	11.51
Morris St. - Brenton St.	0.07	0.00	-	0.38	0.45
Morris St. - Dresden Row	0.20	0.00	-	0.47	0.67
Morris St. - Birmingham St.	0.21	0.00	-	0.65	0.86
Morris St. - Queen St.	29.61	11.39	13.17	3.16	57.32

800.0 An arbitrary delay of 800 seconds was used where the volume to capacity ratios were too high for realistic delay calculations.

Scenario C - Total Vehicle Hours of Delay (PM)	415.12

Scenario D and Future Traffic including Background Growth and Development Traffic

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.6	268	30.5	415	26.2	389	21.3	845
Sackville St. - Dresden Row	0.0	1018	5.6	556	-	-	-	-
Sackville St. - Queen St.	12.5	760	6.6	576	35.8	249	-	-
Sackville St. - Brunswick St.	25.9	646	31.9	77	12.2	199	69.0	1013
Artillery Pl. - Dresden Row	-	-	-	-	-	-	1.2	237
Artillery Pl. - Birmingham St.	8.9	32	0.5	150	5.2	84	2.8	405
Doyle St. - Queen St.	-	-	13.7	63	0.0	129	0.0	425
Doyle St. - Brunswick St.	-	-	-	-	1.3	111	0.0	163
Spring Garden Rd. - South Park St.	21.8	382	14.4	285	21.2	533	11.1	527
Spring Garden Rd. - Brenton St..	0.0	385	1.4	267	-	-	-	-
Spring Garden Rd. - Dresden Row	9.6	322	8.8	220	-	-	20.9	166
Spring Garden Rd. - Birmingham St.	2.3	295	2.1	328	24.1	69	-	-
Spring Garden Rd. - Queen St.	13.2	315	17.9	375	19.8	298	32.0	426
Spring Garden Rd. - Brunswick St.	5.1	357	0.0	240	-	-	177.5	211
Brenton Pl. - South Park St.	-	-	26.6	133	0.0	426	0.6	506
Clyde St. - Brenton St.	10.8	14	11.9	93	7.8	6	0.0	86
Clyde St. - Dresden Row	11.8	14	12.5	67	3.7	34	2.9	92
Clyde St. - Birmingham St.	11.0	81	10.3	106	1.7	32	-	-
Clyde St. - Queen St.	39.6	38	31.1	61	0.6	281	3.5	397
Morris St. - South Park St.	22.4	440	16.7	279	12.2	518	12.5	523
Morris St. - Brenton St.	0.3	372	0.0	239	-	-	13.5	46
Morris St. - Dresden Row	0.8	404	0.0	233	-	-	13.6	18
Morris St. - Birmingham St.	0.5	367	0.0	260	-	-	16.6	34
Morris St. - Queen St.	29.9	376	14.9	232	18.2	231	29.2	373

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	C
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	B	A	D	-
Sackville St. - Brunswick St.	C	C	B	E
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	A	A	A	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	-	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	A	A	-	C
Spring Garden Rd. - Birmingham St.	A	A	C	-
Spring Garden Rd. - Queen St.	B	B	B	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	D	A	A
Clyde St. - Brenton St.	B	B	A	A
Clyde St. - Dresden Row	B	B	A	A
Clyde St. - Birmingham St.	B	B	A	-
Clyde St. - Queen St.	E	D	A	A
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	D	B	C	D

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.83	3.52	2.83	5.00	13.18
Sackville St. - Dresden Row	0.00	0.86	-	-	0.86
Sackville St. - Queen St.	2.64	1.06	2.48	-	6.17
Sackville St. - Brunswick St.	4.65	0.68	0.67	19.42	25.42
Artillery Pl. - Dresden Row	-	-	-	0.08	0.08
Artillery Pl. - Birmingham St.	0.08	0.02	0.12	0.32	0.54
Doyle St. - Queen St.	-	0.24	0.00	0.00	0.24
Doyle St. - Brunswick St.	-	-	0.04	0.00	0.04
Spring Garden Rd. - South Park St.	2.31	1.14	3.14	1.62	8.22
Spring Garden Rd. - Brenton St..	0.00	0.10	-	-	0.10
Spring Garden Rd. - Dresden Row	0.86	0.54	-	0.96	2.36
Spring Garden Rd. - Birmingham St.	0.19	0.19	0.46	-	0.84
Spring Garden Rd. - Queen St.	1.16	1.86	1.64	3.79	8.45
Spring Garden Rd. - Brunswick St.	0.51	0.00	-	10.40	10.91
Brenton Pl. - South Park St.	-	0.98	0.00	0.08	1.07
Clyde St. - Brenton St.	0.04	0.31	0.01	0.00	0.36
Clyde St. - Dresden Row	0.05	0.23	0.03	0.07	0.39
Clyde St. - Birmingham St.	0.25	0.30	0.02	-	0.57
Clyde St. - Queen St.	0.42	0.53	0.05	0.39	1.38
Morris St. - South Park St.	2.74	1.29	1.76	1.82	7.60
Morris St. - Brenton St.	0.03	0.00	-	0.17	0.20
Morris St. - Dresden Row	0.09	0.00	-	0.07	0.16
Morris St. - Birmingham St.	0.05	0.00	-	0.16	0.21
Morris St. - Queen St.	3.12	0.96	1.17	3.03	8.28

Scenario D - Total Vehicle Hours of Delay (AM)	97.62

Intersection Type: Signalized | Stop-Controlled

Legend

Level of Service: Acceptable | Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	26.7	261	33.8	730	21.9	839	32.8	564
Sackville St. - Dresden Row	0.0	581	2.6	690	-	-	-	-
Sackville St. - Queen St.	22.2	821	10.8	668	41.2	637	-	-
Sackville St. - Brunswick St.	58.1	848	43.6	214	32.7	441	99.0	724
Artillery Pl. - Dresden Row	-	-	-	-	-	-	3.5	374
Artillery Pl. - Birmingham St.	36.3	138	1.1	397	102.9	230	8.2	340
Doyle St. - Queen St.	-	-	15.8	58	0.0	362	0.0	342
Doyle St. - Brunswick St.	-	-	-	-	1.2	416	0.0	204
Spring Garden Rd. - South Park St.	27.1	383	25.2	388	26.0	840	9.0	454
Spring Garden Rd. - Brenton St..	0.0	480	3.7	426	-	-	-	-
Spring Garden Rd. - Dresden Row	13.8	346	9.0	377	-	-	25.7	162
Spring Garden Rd. - Birmingham St.	10.3	351	3.8	484	55.5	172	-	-
Spring Garden Rd. - Queen St.	14.6	403	23.9	465	128.0	786	468.7	373
Spring Garden Rd. - Brunswick St.	40.1	677	0.0	526	-	-	800.0	159
Brenton Pl. - South Park St.	-	-	470.8	437	0.0	536	1.3	312
Clyde St. - Brenton St.	11.6	27	18.9	265	7.7	52	0.0	135
Clyde St. - Dresden Row	13.1	27	18.1	175	4.3	79	2.2	139
Clyde St. - Birmingham St.	16.4	112	14.7	254	1.8	74	-	-
Clyde St. - Queen St.	800.0	80	800.0	289	1.5	625	5.3	456
Morris St. - South Park St.	24.4	440	21.8	601	17.6	769	11.5	350
Morris St. - Brenton St.	0.7	376	0.0	510	-	-	19.5	91
Morris St. - Dresden Row	1.6	460	0.0	499	-	-	24.4	35
Morris St. - Birmingham St.	1.9	399	0.0	511	-	-	34.2	71
Morris St. - Queen St.	256.1	443	78.0	563	137.7	207	58.1	284

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	C
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	C	B	D	-
Sackville St. - Brunswick St.	E	D	C	F
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	E	A	F	A
Doyle St. - Queen St.	-	C	A	A
Doyle St. - Brunswick St.	-	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	A
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	-	C
Spring Garden Rd. - Birmingham St.	B	A	F	-
Spring Garden Rd. - Queen St.	B	C	F	F
Spring Garden Rd. - Brunswick St.	E	A	-	F
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	B	C	A	A
Clyde St. - Dresden Row	B	C	A	A
Clyde St. - Birmingham St.	C	B	A	-
Clyde St. - Queen St.	F	F	A	A
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	D
Morris St. - Queen St.	F	F	F	F

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.94	6.85	5.10	5.14	19.03
Sackville St. - Dresden Row	0.00	0.50	-	-	0.50
Sackville St. - Queen St.	5.06	2.00	7.29	-	14.36
Sackville St. - Brunswick St.	13.69	2.59	4.01	19.91	40.19
Artillery Pl. - Dresden Row	-	-	-	0.36	0.36
Artillery Pl. - Birmingham St.	1.39	0.12	6.57	0.77	8.86
Doyle St. - Queen St.	-	0.25	0.00	0.00	0.25
Doyle St. - Brunswick St.	-	-	0.14	0.00	0.14
Spring Garden Rd. - South Park St.	2.88	2.72	6.07	1.14	12.80
Spring Garden Rd. - Brenton St..	0.00	0.44	-	-	0.44
Spring Garden Rd. - Dresden Row	1.33	0.94	-	1.16	3.43
Spring Garden Rd. - Birmingham St.	1.00	0.51	2.65	-	4.17
Spring Garden Rd. - Queen St.	1.63	3.09	27.95	48.56	81.23
Spring Garden Rd. - Brunswick St.	7.54	0.00	-	35.33	42.87
Brenton Pl. - South Park St.	-	57.15	0.00	0.11	57.26
Clyde St. - Brenton St.	0.09	1.39	0.11	0.00	1.59
Clyde St. - Dresden Row	0.10	0.88	0.09	0.08	1.16
Clyde St. - Birmingham St.	0.51	1.04	0.04	-	1.58
Clyde St. - Queen St.	17.78	64.22	0.26	0.67	82.93
Morris St. - South Park St.	2.98	3.64	3.76	1.12	11.50
Morris St. - Brenton St.	0.07	0.00	-	0.49	0.57
Morris St. - Dresden Row	0.20	0.00	-	0.24	0.44
Morris St. - Birmingham St.	0.21	0.00	-	0.67	0.89
Morris St. - Queen St.	31.51	12.20	7.92	4.58	56.21

800.0 An arbitrary delay of 800 seconds was used where the volume to capacity ratios were too high for realistic delay calculations.

Scenario D - Total Vehicle Hours of Delay (PM)	442.77

Future Scenarios with modifications

Scenario C with modifications and Future Traffic including Background Growth and Development Traffic

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.6	268	30.5	415	26.2	389	27.9	845
Sackville St. - Dresden Row	0.0	1018	4.6	556	-	-	-	-
Sackville St. - Queen St.	12.6	760	6.6	576	34.8	249	-	-
Sackville St. - Brunswick St.	24.4	646	31.5	77	11.8	199	37.9	1013
Artillery Pl. - Dresden Row	-	-	-	-	-	-	1.2	237
Artillery Pl. - Birmingham St.	10.1	21	0.5	150	7.0	84	2.2	405
Doyle St. - Queen St.	-	-	14.1	63	0.0	145	0.4	425
Doyle St. - Brunswick St.	9.9	17	-	-	0.0	78	0.0	163
Spring Garden Rd. - South Park St.	21.8	382	14.5	285	21.1	533	11.1	526
Spring Garden Rd. - Brenton St..	0.0	399	0.9	253	-	-	-	-
Spring Garden Rd. - Dresden Row	10.9	336	8.7	232	-	-	20.0	166
Spring Garden Rd. - Birmingham St.	1.8	295	2.2	339	22.6	69	-	-
Spring Garden Rd. - Queen St.	10.4	315	17.4	375	12.3	299	28.5	409
Spring Garden Rd. - Brunswick St.	3.9	325	0.0	240	-	-	36.3	211
Brenton Pl. - South Park St.	-	-	17.4	133	0.0	425	0.0	488
Clyde St. - Brenton St.	-	-	0.3	93	12.5	6	11.1	72
Clyde St. - Dresden Row	-	-	0.9	67	10.3	34	11.0	117
Clyde St. - Birmingham St.	1.7	67	0.4	105	11.0	32	-	-
Clyde St. - Queen St.	21.5	38	21.7	61	8.5	281	11.1	475
Morris St. - South Park St.	20.8	440	15.6	279	12.2	518	12.7	523
Morris St. - Brenton St.	0.3	372	0.0	252	-	-	14.5	32
Morris St. - Dresden Row	0.8	404	0.0	221	-	-	13.3	42
Morris St. - Birmingham St.	0.5	367	0.0	248	-	-	16.4	34
Morris St. - Queen St.	17.4	376	15.1	232	18.5	231	13.8	362

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	C
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	B	A	D	-
Sackville St. - Brunswick St.	C	C	B	D
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	B	A	A	A
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	A	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	A	-	C
Spring Garden Rd. - Birmingham St.	A	A	C	-
Spring Garden Rd. - Queen St.	B	B	B	C
Spring Garden Rd. - Brunswick St.	A	A	-	E
Brenton Pl. - South Park St.	-	C	A	A
Clyde St. - Brenton St.	-	A	B	B
Clyde St. - Dresden Row	-	A	B	B
Clyde St. - Birmingham St.	A	A	B	-
Clyde St. - Queen St.	C	C	A	B
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	B	B	B	B

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.83	3.52	2.83	6.55	14.73
Sackville St. - Dresden Row	0.00	0.71	-	-	0.71
Sackville St. - Queen St.	2.66	1.06	2.41	-	6.12
Sackville St. - Brunswick St.	4.38	0.67	0.65	10.66	16.37
Artillery Pl. - Dresden Row	-	-	-	0.08	0.08
Artillery Pl. - Birmingham St.	0.06	0.02	0.16	0.25	0.49
Doyle St. - Queen St.	-	0.25	0.00	0.05	0.29
Doyle St. - Brunswick St.	0.05	-	0.00	0.00	0.05
Spring Garden Rd. - South Park St.	2.31	1.15	3.12	1.62	8.21
Spring Garden Rd. - Brenton St..	0.00	0.06	-	-	0.06
Spring Garden Rd. - Dresden Row	1.02	0.56	-	0.92	2.50
Spring Garden Rd. - Birmingham St.	0.15	0.21	0.43	-	0.79
Spring Garden Rd. - Queen St.	0.91	1.81	1.02	3.24	6.98
Spring Garden Rd. - Brunswick St.	0.35	0.00	-	2.13	2.48
Brenton Pl. - South Park St.	-	0.64	0.00	0.00	0.64
Clyde St. - Brenton St.	-	0.01	0.02	0.22	0.25
Clyde St. - Dresden Row	-	0.02	0.10	0.36	0.47
Clyde St. - Birmingham St.	0.03	0.01	0.10	-	0.14
Clyde St. - Queen St.	0.23	0.37	0.66	1.46	2.72
Morris St. - South Park St.	2.54	1.21	1.76	1.85	7.35
Morris St. - Brenton St.	0.03	0.00	-	0.13	0.16
Morris St. - Dresden Row	0.09	0.00	-	0.16	0.24
Morris St. - Birmingham St.	0.05	0.00	-	0.15	0.21
Morris St. - Queen St.	1.82	0.97	1.19	1.39	5.37

Scenario C modified- Total Vehicle Hours of Delay (AM)	77.42

Intersection Type

Signalized	Stop-Controlled

Legend

Level of Service

Acceptable	Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	26.7	261	31.4	730	22.0	839	43.3	564
Sackville St. - Dresden Row	0.0	581	2.4	690	-	-	-	-
Sackville St. - Queen St.	22.4	821	12.9	668	33.3	637	-	-
Sackville St. - Brunswick St.	46.2	848	44.5	214	28.1	441	51.6	724
Artillery Pl. - Dresden Row	-	-	-	-	-	-	3.5	374
Artillery Pl. - Birmingham St.	17.6	138	1.2	397	39.2	230	1.0	340
Doyle St. - Queen St.	-	-	17.6	58	0.0	446	1.3	340
Doyle St. - Brunswick St.	17.2	104	-	-	0.2	294	0.0	224
Spring Garden Rd. - South Park St.	28.2	383	28.6	388	26.0	840	11.4	453
Spring Garden Rd. - Brenton St..	0.0	507	1.3	403	-	-	-	-
Spring Garden Rd. - Dresden Row	14.7	373	11.1	396	-	-	24.8	162
Spring Garden Rd. - Birmingham St.	8.3	351	3.2	504	35.6	172	-	-
Spring Garden Rd. - Queen St.	19.6	403	40.2	465	35.5	786	20.3	335
Spring Garden Rd. - Brunswick St.	6.9	555	0.0	526	-	-	128.3	159
Brenton Pl. - South Park St.	-	-	162.9	437	0.0	536	0.0	284
Clyde St. - Brenton St.	-	-	0.6	265	18.4	52	13.5	111
Clyde St. - Dresden Row	-	-	0.6	175	13.4	79	14.9	182
Clyde St. - Birmingham St.	2.4	85	0.4	254	13.9	74	-	-
Clyde St. - Queen St.	24.4	80	37.6	289	12.9	625	24.5	436
Morris St. - South Park St.	24.6	440	21.8	601	17.6	769	11.8	350
Morris St. - Brenton St.	0.7	376	0.0	534	-	-	20.3	68
Morris St. - Dresden Row	1.6	460	0.0	479	-	-	21.8	86
Morris St. - Birmingham St.	1.9	399	0.0	491	-	-	35.2	71
Morris St. - Queen St.	47.5	443	13.6	563	45.2	375	29.1	264

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	D
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	C	B	D	-
Sackville St. - Brunswick St.	D	D	C	D
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	C	A	E	A
Doyle St. - Queen St.	-	C	A	A
Doyle St. - Brunswick St.	C	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	B	-	C
Spring Garden Rd. - Birmingham St.	A	A	E	-
Spring Garden Rd. - Queen St.	B	D	D	C
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	-	A	C	B
Clyde St. - Dresden Row	-	A	B	B
Clyde St. - Birmingham St.	A	A	B	-
Clyde St. - Queen St.	C	D	B	C
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	C
Morris St. - Birmingham St.	A	A	-	E
Morris St. - Queen St.	D	B	D	C

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.94	6.37	5.13	6.78	20.21
Sackville St. - Dresden Row	0.00	0.46	-	-	0.46
Sackville St. - Queen St.	5.11	2.39	5.89	-	13.39
Sackville St. - Brunswick St.	10.88	2.65	3.44	10.38	27.35
Artillery Pl. - Dresden Row	-	-	-	0.36	0.36
Artillery Pl. - Birmingham St.	0.67	0.13	2.50	0.09	3.41
Doyle St. - Queen St.	-	0.28	0.00	0.12	0.41
Doyle St. - Brunswick St.	0.50	-	0.02	0.00	0.51
Spring Garden Rd. - South Park St.	3.00	3.08	6.07	1.43	13.58
Spring Garden Rd. - Brenton St..	0.00	0.15	-	-	0.15
Spring Garden Rd. - Dresden Row	1.52	1.22	-	1.12	3.86
Spring Garden Rd. - Birmingham St.	0.81	0.45	1.70	-	2.96
Spring Garden Rd. - Queen St.	2.19	5.19	7.75	1.89	17.03
Spring Garden Rd. - Brunswick St.	1.06	0.00	-	5.67	6.73
Brenton Pl. - South Park St.	-	19.77	0.00	0.00	19.77
Clyde St. - Brenton St.	-	0.04	0.27	0.42	0.73
Clyde St. - Dresden Row	-	0.03	0.29	0.75	1.08
Clyde St. - Birmingham St.	0.06	0.03	0.29	-	0.37
Clyde St. - Queen St.	0.54	3.02	2.24	2.97	8.77
Morris St. - South Park St.	3.01	3.64	3.76	1.15	11.55
Morris St. - Brenton St.	0.07	0.00	-	0.38	0.46
Morris St. - Dresden Row	0.20	0.00	-	0.52	0.73
Morris St. - Birmingham St.	0.21	0.00	-	0.69	0.90
Morris St. - Queen St.	5.85	2.13	4.71	2.13	14.81

Scenario C modified - Total Vehicle Hours of Delay (PM)	169.58

Scenario D with modifications and Future Traffic including Background Growth and Development Traffic

2020 AM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	24.6	268	30.4	415	26.3	389	27.9	845
Sackville St. - Dresden Row	0.0	1018	4.6	556	-	-	-	-
Sackville St. - Queen St.	12.6	760	6.6	576	28.0	249	-	-
Sackville St. - Brunswick St.	24.4	646	31.5	77	11.8	199	37.9	1013
Artillery Pl. - Dresden Row	-	-	-	-	-	-	1.2	237
Artillery Pl. - Birmingham St.	18.6	32	0.5	150	12.5	84	24.9	405
Doyle St. - Queen St.	-	-	14.1	63	0.0	145	0.4	425
Doyle St. - Brunswick St.	9.9	17	-	-	0.0	78	0.0	163
Spring Garden Rd. - South Park St.	21.8	382	16.8	285	21.1	533	11.1	526
Spring Garden Rd. - Brenton St..	0.0	399	1.4	267	-	-	-	-
Spring Garden Rd. - Dresden Row	10.3	336	10.6	220	-	-	20.9	166
Spring Garden Rd. - Birmingham St.	1.6	295	2.1	328	19.0	69	-	-
Spring Garden Rd. - Queen St.	10.9	315	12.2	375	22.9	299	34.3	409
Spring Garden Rd. - Brunswick St.	3.9	325	0.0	240	-	-	36.3	211
Brenton Pl. - South Park St.	-	-	17.4	133	0.0	425	0.0	488
Clyde St. - Brenton St.	-	-	0.3	93	12.7	6	11.4	86
Clyde St. - Dresden Row	-	-	0.9	67	10.2	34	10.6	92
Clyde St. - Birmingham St.	1.7	67	0.5	106	11.1	32	-	-
Clyde St. - Queen St.	17.4	38	17.5	61	8.2	281	10.3	397
Morris St. - South Park St.	22.4	440	16.7	279	12.2	518	12.7	523
Morris St. - Brenton St.	0.3	372	0.0	239	-	-	13.5	46
Morris St. - Dresden Row	0.8	404	0.0	233	-	-	13.6	18
Morris St. - Birmingham St.	0.5	367	0.0	260	-	-	16.6	21
Morris St. - Queen St.	21.4	376	15.2	232	12.0	231	13.1	373

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	C
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	B	A	D	-
Sackville St. - Brunswick St.	C	C	B	D
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	C	A	B	C
Doyle St. - Queen St.	-	B	A	A
Doyle St. - Brunswick St.	A	-	A	A
Spring Garden Rd. - South Park St.	C	B	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	B	-	C
Spring Garden Rd. - Birmingham St.	A	A	C	-
Spring Garden Rd. - Queen St.	B	B	C	C
Spring Garden Rd. - Brunswick St.	A	A	-	E
Brenton Pl. - South Park St.	-	C	A	A
Clyde St. - Brenton St.	-	A	B	B
Clyde St. - Dresden Row	-	A	B	B
Clyde St. - Birmingham St.	A	A	B	-
Clyde St. - Queen St.	C	C	A	B
Morris St. - South Park St.	C	B	B	B
Morris St. - Brenton St.	A	A	-	B
Morris St. - Dresden Row	A	A	-	B
Morris St. - Birmingham St.	A	A	-	C
Morris St. - Queen St.	C	C	B	B

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.83	3.50	2.84	6.55	14.73
Sackville St. - Dresden Row	0.00	0.71	-	-	0.71
Sackville St. - Queen St.	2.66	1.06	1.94	-	5.65
Sackville St. - Brunswick St.	4.38	0.67	0.65	10.66	16.37
Artillery Pl. - Dresden Row	-	-	-	0.08	0.08
Artillery Pl. - Birmingham St.	0.17	0.02	0.29	2.80	3.28
Doyle St. - Queen St.	-	0.25	0.00	0.05	0.29
Doyle St. - Brunswick St.	0.05	-	0.00	0.00	0.05
Spring Garden Rd. - South Park St.	2.31	1.33	3.12	1.62	8.39
Spring Garden Rd. - Brenton St..	0.00	0.10	-	-	0.10
Spring Garden Rd. - Dresden Row	0.96	0.65	-	0.96	2.57
Spring Garden Rd. - Birmingham St.	0.13	0.19	0.36	-	0.69
Spring Garden Rd. - Queen St.	0.95	1.27	1.90	3.90	8.02
Spring Garden Rd. - Brunswick St.	0.35	0.00	-	2.13	2.48
Brenton Pl. - South Park St.	-	0.64	0.00	0.00	0.64
Clyde St. - Brenton St.	-	0.01	0.02	0.27	0.30
Clyde St. - Dresden Row	-	0.02	0.10	0.27	0.38
Clyde St. - Birmingham St.	0.03	0.01	0.10	-	0.15
Clyde St. - Queen St.	0.18	0.30	0.64	1.14	2.26
Morris St. - South Park St.	2.74	1.29	1.76	1.85	7.63
Morris St. - Brenton St.	0.03	0.00	-	0.17	0.20
Morris St. - Dresden Row	0.09	0.00	-	0.07	0.16
Morris St. - Birmingham St.	0.05	0.00	-	0.10	0.15
Morris St. - Queen St.	2.24	0.98	0.77	1.36	5.34

Scenario D modified - Total Vehicle Hours of Delay (AM)	80.63

Intersection Type

Signalized	Stop-Controlled

Legend

Level of Service

Acceptable	Poor

2020 PM

Intersection	Approach							
	EB		WB		NB		SB	
	Delay	Volume	Delay	Volume	Delay	Volume	Delay	Volume
Sackville St. - South Park St.	26.7	261	31.4	730	21.9	839	43.3	564
Sackville St. - Dresden Row	0.0	581	2.4	690	-	-	-	-
Sackville St. - Queen St.	22.3	821	12.9	668	33.3	637	-	-
Sackville St. - Brunswick St.	46.2	848	44.5	214	28.1	441	51.6	724
Artillery Pl. - Dresden Row	-	-	-	-	-	-	3.5	374
Artillery Pl. - Birmingham St.	21.3	138	1.6	397	52.3	230	1.6	340
Doyle St. - Queen St.	-	-	17.6	58	0.0	446	1.3	342
Doyle St. - Brunswick St.	17.2	104	-	-	0.2	294	0.0	204
Spring Garden Rd. - South Park St.	27.1	383	28.2	388	26.0	840	11.4	453
Spring Garden Rd. - Brenton St..	0.0	507	3.6	426	-	-	-	-
Spring Garden Rd. - Dresden Row	15.8	373	11.6	377	-	-	24.8	162
Spring Garden Rd. - Birmingham St.	23.1	351	2.7	484	74.0	172	-	-
Spring Garden Rd. - Queen St.	27.8	403	30.7	465	32.1	786	19.2	335
Spring Garden Rd. - Brunswick St.	6.9	555	0.0	526	-	-	83.4	
Brenton Pl. - South Park St.	-	-	162.9	437	0.0	536	0.0	284
Clyde St. - Brenton St.	-	-	0.6	265	19.6	52	14.5	135
Clyde St. - Dresden Row	-	-	0.6	175	12.6	79	13.7	139
Clyde St. - Birmingham St.	3.9	112	0.4	254	14.9	74	-	-
Clyde St. - Queen St.	24.4	80	37.6	289	12.9	625	26.0	456
Morris St. - South Park St.	24.5	440	21.8	601	17.6	769	11.9	350
Morris St. - Brenton St.	0.7	376	0.0	510	-	-	19.6	91
Morris St. - Dresden Row	1.6	460	0.0	499	-	-	25.2	35
Morris St. - Birmingham St.	1.9	399	0.0	511	-	-	36.9	71
Morris St. - Queen St.	47.5	443	13.6	566	48.1	375	31.5	284

Intersection	Approach			
	EB	WB	NB	SB
Sackville St. - South Park St.	C	C	C	D
Sackville St. - Dresden Row	A	A	-	-
Sackville St. - Queen St.	C	B	D	-
Sackville St. - Brunswick St.	D	D	C	D
Artillery Pl. - Dresden Row	-	-	-	A
Artillery Pl. - Birmingham St.	C	A	F	A
Doyle St. - Queen St.	-	C	A	A
Doyle St. - Brunswick St.	C	-	A	A
Spring Garden Rd. - South Park St.	C	C	C	B
Spring Garden Rd. - Brenton St..	A	A	-	-
Spring Garden Rd. - Dresden Row	B	B	-	C
Spring Garden Rd. - Birmingham St.	C	A	F	-
Spring Garden Rd. - Queen St.	C	C	C	B
Spring Garden Rd. - Brunswick St.	A	A	-	F
Brenton Pl. - South Park St.	-	F	A	A
Clyde St. - Brenton St.	-	A	C	B
Clyde St. - Dresden Row	-	A	B	B
Clyde St. - Birmingham St.	A	A	B	-
Clyde St. - Queen St.	C	D	B	C
Morris St. - South Park St.	C	C	B	B
Morris St. - Brenton St.	A	A	-	C
Morris St. - Dresden Row	A	A	-	D
Morris St. - Birmingham St.	A	A	-	E
Morris St. - Queen St.	D	B	D	C

Intersection	Approach - Volume				Total Delay
	EB	WB	NB	SB	
Sackville St. - South Park St.	1.94	6.37	5.10	6.78	20.19
Sackville St. - Dresden Row	0.00	0.46	-	-	0.46
Sackville St. - Queen St.	5.09	2.39	5.89	-	13.37
Sackville St. - Brunswick St.	10.88	2.65	3.44	10.38	27.35
Artillery Pl. - Dresden Row	-	-	-	0.36	0.36
Artillery Pl. - Birmingham St.	0.82	0.18	3.34	0.15	4.49
Doyle St. - Queen St.	-	0.28	0.00	0.12	0.41
Doyle St. - Brunswick St.	0.50	-	0.02	0.00	0.51
Spring Garden Rd. - South Park St.	2.88	3.04	6.07	1.43	13.42
Spring Garden Rd. - Brenton St..	0.00	0.43	-	-	0.43
Spring Garden Rd. - Dresden Row	1.64	1.21	-	1.12	3.97
Spring Garden Rd. - Birmingham St.	2.25	0.36	3.54	-	6.15
Spring Garden Rd. - Queen St.	3.11	3.97	7.01	1.79	15.87
Spring Garden Rd. - Brunswick St.	1.06	0.00	-	0.00	1.06
Brenton Pl. - South Park St.	-	19.77	0.00	0.00	19.77
Clyde St. - Brenton St.	-	0.04	0.28	0.54	0.87
Clyde St. - Dresden Row	-	0.03	0.28	0.53	0.83
Clyde St. - Birmingham St.	0.12	0.03	0.31	-	0.46
Clyde St. - Queen St.	0.54	3.02	2.24	3.29	9.09
Morris St. - South Park St.	2.99	3.64	3.76	1.16	11.55
Morris St. - Brenton St.	0.07	0.00	-	0.50	0.57
Morris St. - Dresden Row	0.20	0.00	-	0.25	0.45
Morris St. - Birmingham St.	0.21	0.00	-	0.73	0.94
Morris St. - Queen St.	5.85	2.14	5.01	2.49	15.48

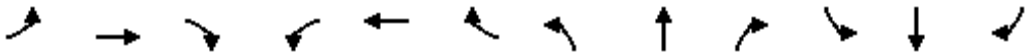
Scenario D modified - Total Vehicle Hours of Delay (PM)	168.06

Appendix C

Modelling Results

- Scenario A 2020 AM with background traffic growth
- Scenario A 2020 PM with background traffic growth
- Scenario B 2020 AM with background traffic growth
- Scenario B 2020 PM with background traffic growth
- Scenario C 2020 AM with background traffic growth
- Scenario C 2020 PM with background traffic growth
- Scenario D 2020 AM with background traffic growth
- Scenario D 2020 PM with background traffic growth
- Scenario A 2020 AM with background traffic growth and development
- Scenario A 2020 PM with background traffic growth and development
- Scenario B 2020 AM with background traffic growth and development
- Scenario B 2020 PM with background traffic growth and development
- Scenario C 2020 AM with background traffic growth and development
- Scenario C 2020 PM with background traffic growth and development
- Scenario D 2020 AM with background traffic growth and development
- Scenario D 2020 PM with background traffic growth and development
- Scenario C 2020 AM with modifications
- Scenario C 2020 PM with modifications
- Scenario D 2020 AM with modifications
- Scenario D 2020 PM with modifications

Scenario A 2020 AM with background traffic growth



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.94		1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1456	1608			1514		1626	1624		1473	1494	
Flt Permitted	0.63	1.00			0.90		0.15	1.00		0.54	1.00	
Satd. Flow (perm)	969	1608			1378		263	1624		840	1494	
Volume (vph)	248	328	35	7	35	34	9	161	25	224	271	484
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	273	349	50	18	41	41	18	201	36	238	327	563
RTOR Reduction (vph)	0	7	0	0	28	0	0	9	0	0	86	0
Lane Group Flow (vph)	273	392	0	0	72	0	18	228	0	238	804	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			20.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	38.0	38.0			22.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.53	0.53			0.31		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	593	849			421		95	586		303	540	
v/s Ratio Prot	0.08	c0.24						0.14			c0.54	
v/s Ratio Perm	0.17				0.05		0.07			0.28		
v/c Ratio	0.46	0.46			0.17		0.19	0.39		0.79	1.49	
Uniform Delay, d1	10.2	10.6			18.3		15.8	17.1		20.5	23.0	
Progression Factor	1.00	1.00			1.48		1.01	1.02		1.12	1.04	
Incremental Delay, d2	2.6	1.8			0.9		4.4	1.9		14.3	227.2	
Delay (s)	12.7	12.4			27.9		20.3	19.4		37.2	251.1	
Level of Service	B	B			C		C	B		D	F	
Approach Delay (s)		12.5			27.9			19.4			206.0	
Approach LOS		B			C			B			F	

Intersection Summary			
HCM Average Control Delay	115.3	HCM Level of Service	F
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	4%	
Volume (veh/h)	554	184	139	411	38	63
Peak Hour Factor	0.91	0.82	0.87	0.82	0.85	0.88
Hourly flow rate (vph)	609	224	160	501	45	72
Pedestrians	4			5	44	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	4	
Right turn flare (veh)						7
Median type					None	
Median storage veh)						
Upstream signal (m)	192			195		
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			877		1339	770
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			863		1378	744
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			76		50	77
cM capacity (veh/h)			669		90	311

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	833	327	334	116
Volume Left	0	160	0	45
Volume Right	224	0	0	72
cSH	1700	669	1700	235
Volume to Capacity	0.49	0.24	0.20	0.50
Queue Length 95th (m)	0.0	7.0	0.0	19.1
Control Delay (s)	0.0	7.5	0.0	42.7
Lane LOS		A		E
Approach Delay (s)	0.0	3.7		42.7
Approach LOS				E

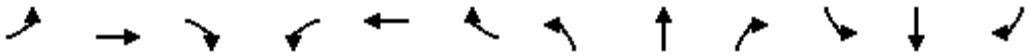
Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	829	153	119	384	36	46
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	855	158	135	436	43	55
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			229		
pX, platoon unblocked			0.75		0.75	0.75
vC, conflicting volume			1047		1459	977
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1063		1614	969
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			71		11	70
cM capacity (veh/h)			473		49	182

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1012	281	291	99
Volume Left	0	135	0	43
Volume Right	158	0	0	55
cSH	1700	473	1700	83
Volume to Capacity	0.60	0.29	0.17	1.19
Queue Length 95th (m)	0.0	8.9	0.0	54.5
Control Delay (s)	0.0	10.1	0.0	250.7
Lane LOS		B		F
Approach Delay (s)	0.0	4.9		250.7
Approach LOS				F

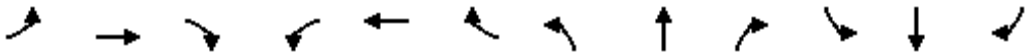
Intersection Summary			
Average Delay	16.4		
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	60	216	49	44	137	43	36	134	54	136	166	34
Peak Hour Factor	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Hourly flow rate (vph)	62	223	51	47	146	46	40	151	61	143	175	36

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	335	193	46	252	354
Volume Left (vph)	62	47	0	40	143
Volume Right (vph)	51	0	46	61	36
Hadj (s)	-0.02	0.16	-0.67	-0.08	0.05
Departure Headway (s)	6.6	7.5	6.6	6.6	6.5
Degree Utilization, x	0.62	0.40	0.08	0.46	0.64
Capacity (veh/h)	501	427	478	484	510
Control Delay (s)	19.7	14.1	9.0	15.3	20.3
Approach Delay (s)	19.7	13.1		15.3	20.3
Approach LOS	C	B		C	C

Intersection Summary				
Delay	17.6			
HCM Level of Service	C			
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1997			1712	1502		1859	1350	1634	1812	
Flt Permitted		0.98			0.65	1.00		0.97	1.00	0.37	1.00	
Satd. Flow (perm)		1962			1136	1502		1815	1350	632	1812	
Volume (vph)	11	206	39	109	161	132	12	243	115	463	339	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	224	42	115	169	139	13	270	128	503	368	7
RTOR Reduction (vph)	0	8	0	0	0	96	0	0	90	0	1	0
Lane Group Flow (vph)	0	270	0	0	284	43	0	283	38	503	374	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		21.0	21.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		24.0	24.0	47.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.30	0.30	0.59	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		613			355	469		545	405	609	1065	
v/s Ratio Prot										c0.20	0.21	
v/s Ratio Perm		0.14			c0.25	0.03		0.16	0.03	c0.29		
v/c Ratio		0.44			0.80	0.09		0.52	0.09	0.83	0.35	
Uniform Delay, d1		21.9			25.2	19.5		23.2	20.2	11.2	8.6	
Progression Factor		1.00			1.00	1.00		0.88	1.24	1.00	1.00	
Incremental Delay, d2		2.3			17.1	0.4		2.9	0.4	12.1	0.9	
Delay (s)		24.2			42.3	19.9		23.3	25.5	23.3	9.5	
Level of Service		C			D	B		C	C	C	A	
Approach Delay (s)		24.2			34.9			24.0			17.4	
Approach LOS		C			C			C			B	

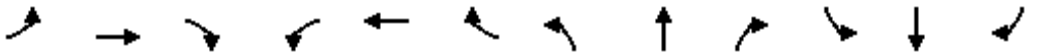
Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1589	1652		1677	1874	1369		3234			3480	1527
Flt Permitted	0.58	1.00		0.32	1.00	1.00		0.67			0.67	1.00
Satd. Flow (perm)	978	1652		562	1874	1369		2189			2345	1527
Volume (vph)	40	200	188	55	176	35	97	311	91	106	353	41
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	238	219	62	210	49	156	389	99	129	430	76
RTOR Reduction (vph)	0	41	0	0	0	29	0	18	0	0	0	39
Lane Group Flow (vph)	49	416	0	62	210	20	0	626	0	0	559	37
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	403	681		232	773	565		1067			1143	744
v/s Ratio Prot		c0.25			0.11							
v/s Ratio Perm	0.05			0.11		0.01		c0.29			0.24	0.02
v/c Ratio	0.12	0.61		0.27	0.27	0.04		0.59			0.49	0.05
Uniform Delay, d1	14.5	18.5		15.5	15.5	14.0		14.7			13.8	10.8
Progression Factor	0.97	0.92		1.00	1.00	1.00		0.65			0.84	0.61
Incremental Delay, d2	0.6	3.9		2.8	0.9	0.1		2.1			1.4	0.1
Delay (s)	14.6	20.8		18.3	16.4	14.1		11.7			12.9	6.7
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		20.2			16.4			11.7			12.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.91		1.00	1.00	0.68
Flpb, ped/bikes	0.75	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1203	1564	545		1310	802	1658	1615		1790	1773	1021
Flt Permitted	0.55	1.00	1.00		0.92	1.00	0.38	1.00		0.32	1.00	1.00
Satd. Flow (perm)	693	1564	545		1209	802	654	1615		609	1773	1021
Volume (vph)	80	193	93	35	174	67	39	395	56	68	396	49
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	131	230	112	41	193	81	53	454	81	101	471	53
RTOR Reduction (vph)	0	0	69	0	0	50	0	8	0	0	0	20
Lane Group Flow (vph)	131	230	43	0	234	31	53	527	0	101	471	33
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	28.0	28.0	28.0		28.0	28.0	38.0	38.0		38.0	38.0	38.0
Effective Green, g (s)	31.0	31.0	31.0		31.0	31.0	41.0	41.0		41.0	41.0	41.0
Actuated g/C Ratio	0.39	0.39	0.39		0.39	0.39	0.51	0.51		0.51	0.51	0.51
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	269	606	211		468	311	335	828		312	909	523
v/s Ratio Prot		0.15						c0.33			0.27	
v/s Ratio Perm	0.19		0.08		c0.19	0.04	0.08			0.17		0.03
v/c Ratio	0.49	0.38	0.21		0.50	0.10	0.16	0.64		0.32	0.52	0.06
Uniform Delay, d1	18.5	17.6	16.3		18.6	15.6	10.3	14.1		11.4	12.9	9.8
Progression Factor	1.00	1.00	1.00		0.73	0.43	1.07	1.25		0.76	0.78	0.60
Incremental Delay, d2	6.2	1.8	2.2		3.7	0.6	0.9	3.5		2.6	2.0	0.2
Delay (s)	24.7	19.4	18.5		17.3	7.3	12.0	21.1		11.2	12.1	6.1
Level of Service	C	B	B		B	A	B	C		B	B	A
Approach Delay (s)		20.6			14.7			20.3			11.4	
Approach LOS		C			B			C			B	

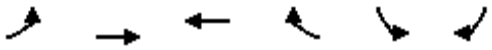
Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	16	60	421	0	0	484
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	65	458	0	0	526
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.92	0.88			0.88	
vC, conflicting volume	1190	615			530	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1004	560			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	84			100	
cM capacity (veh/h)	204	402			903	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	17	65	458	526
Volume Left	17	0	0	0
Volume Right	0	65	0	0
cSH	204	402	1700	1700
Volume to Capacity	0.09	0.16	0.27	0.31
Queue Length 95th (m)	2.1	4.4	0.0	0.0
Control Delay (s)	24.3	15.7	0.0	0.0
Lane LOS	C	C		
Approach Delay (s)	17.5		0.0	0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		



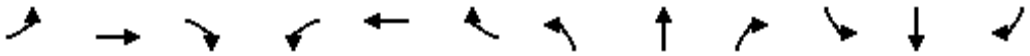
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	8	342	236	4	20	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	372	257	4	22	11
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	345				735	343
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	345				735	343
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	1127				355	650

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	380	261	33
Volume Left	9	0	22
Volume Right	0	4	11
cSH	1127	1700	419
Volume to Capacity	0.01	0.15	0.08
Queue Length 95th (m)	0.2	0.0	1.9
Control Delay (s)	0.3	0.0	14.3
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	14.3
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.90		1.00	0.92			0.87			0.79	
Flpb, ped/bikes	0.57	1.00		0.72	1.00			0.96			0.94	
Frt	1.00	0.98		1.00	0.98			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	901	1414		1215	1272			1684			1503	
Flt Permitted	0.57	1.00		0.49	1.00			0.96			0.96	
Satd. Flow (perm)	543	1414		627	1272			1626			1457	
Volume (vph)	19	243	39	13	193	20	3	27	10	20	73	55
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	36	289	53	22	224	27	8	31	13	27	95	76
RTOR Reduction (vph)	0	8	0	0	5	0	0	8	0	0	28	0
Lane Group Flow (vph)	36	334	0	22	246	0	0	44	0	0	170	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.0	40.0		40.0	40.0			28.0			28.0	
Effective Green, g (s)	42.0	42.0		42.0	42.0			30.0			30.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.38			0.38	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	285	742		329	668			610			546	
v/s Ratio Prot		c0.24			0.19							
v/s Ratio Perm	0.07			0.04				0.03			c0.12	
v/c Ratio	0.13	0.45		0.07	0.37			0.07			0.31	
Uniform Delay, d1	9.7	11.8		9.4	11.2			16.1			17.7	
Progression Factor	0.77	0.77		0.76	0.69			0.93			0.97	
Incremental Delay, d2	0.9	1.9		0.4	1.5			0.2			1.5	
Delay (s)	8.3	11.0		7.5	9.3			15.1			18.7	
Level of Service	A	B		A	A			B			B	
Approach Delay (s)		10.7			9.1			15.1			18.7	
Approach LOS		B			A			B			B	

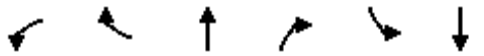
Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			1%			2%			-4%	
Volume (veh/h)	15	248	7	11	206	16	4	6	9	6	12	8
Peak Hour Factor	0.65	0.92	0.38	0.83	0.75	0.88	0.33	0.50	0.67	0.42	0.92	0.58
Hourly flow rate (vph)	23	270	18	13	275	18	12	12	13	14	13	14
Pedestrians		96			2			324			324	
Lane Width (m)		3.0			3.0			3.9			4.8	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			0			29			36	
Right turn flare (veh)									4			
Median type								None			None	
Median storage veh)												
Upstream signal (m)		80			81							
pX, platoon unblocked	0.95			0.95			0.97	0.97	0.95	0.97	0.97	0.95
vC, conflicting volume	617			612			1066	1292	605	965	1292	704
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	595			591			989	1221	583	884	1221	687
tC, single (s)	4.1			4.2			7.1	6.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	96			98			82	84	96	82	83	95
cM capacity (veh/h)	600			645			66	75	316	78	75	255

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	23	288	13	293	38	41
Volume Left	23	0	13	0	12	14
Volume Right	0	18	0	18	13	14
cSH	600	1700	645	1700	110	100
Volume to Capacity	0.04	0.17	0.02	0.17	0.34	0.41
Queue Length 95th (m)	0.9	0.0	0.5	0.0	10.3	12.9
Control Delay (s)	11.2	0.0	10.7	0.0	57.6	64.1
Lane LOS	B		B		F	F
Approach Delay (s)	0.8		0.5		57.6	64.1
Approach LOS					F	F

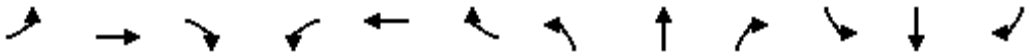
Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	46	17	67	15	17	261
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	18	73	16	18	284
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			61			
pX, platoon unblocked						
vC, conflicting volume	447	127			110	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	447	127			110	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	98			99	
cM capacity (veh/h)	541	887			1453	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	89	302
Volume Left	50	0	18
Volume Right	18	16	0
cSH	604	1700	1453
Volume to Capacity	0.11	0.05	0.01
Queue Length 95th (m)	2.9	0.0	0.3
Control Delay (s)	11.7	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	11.7	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.90		1.00	0.98		1.00	0.80			0.96	
Flpb, ped/bikes		0.97		0.65	1.00		1.00	1.00			0.99	
Frt		0.98		1.00	0.99		1.00	0.91			0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		2602		1073	1400		1503	1368			1990	
Flt Permitted		0.93		0.54	1.00		0.45	1.00			0.97	
Satd. Flow (perm)		2426		608	1400		709	1368			1933	
Volume (vph)	13	221	45	127	225	7	30	84	115	12	225	25
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	22	276	58	161	250	9	36	94	151	22	256	31
RTOR Reduction (vph)	0	20	0	0	2	0	0	72	0	0	5	0
Lane Group Flow (vph)	0	336	0	161	257	0	36	173	0	0	304	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		43.0		43.0	43.0		25.0	25.0			25.0	
Effective Green, g (s)		45.0		45.0	45.0		27.0	27.0			27.0	
Actuated g/C Ratio		0.56		0.56	0.56		0.34	0.34			0.34	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1365		342	788		239	462			652	
v/s Ratio Prot					0.18			0.13				
v/s Ratio Perm		0.14		c0.27			0.05				c0.16	
v/c Ratio		0.25		0.47	0.33		0.15	0.37			0.47	
Uniform Delay, d1		8.9		10.4	9.4		18.5	20.1			20.8	
Progression Factor		0.80		1.00	1.00		1.00	1.00			1.13	
Incremental Delay, d2		0.4		4.6	1.1		1.3	2.3			2.3	
Delay (s)		7.5		15.0	10.5		19.8	22.4			25.8	
Level of Service		A		B	B		B	C			C	
Approach Delay (s)		7.5			12.2			22.1			25.8	
Approach LOS		A			B			C			C	

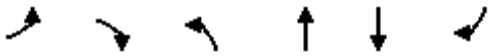
Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	315	46	19	222	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	342	50	21	241	0	0
Pedestrians	300				200	
Lane Width (m)	3.0				0.0	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	21				0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			592		1150	567
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			556		1163	529
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			932		153	505

Direction, Lane #	EB 1	WB 1
Volume Total	392	262
Volume Left	0	21
Volume Right	50	0
cSH	1700	932
Volume to Capacity	0.23	0.02
Queue Length 95th (m)	0.0	0.5
Control Delay (s)	0.0	0.9
Lane LOS		A
Approach Delay (s)	0.0	0.9
Approach LOS		

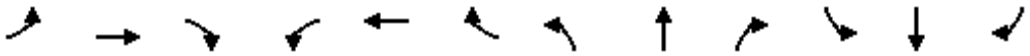
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	8	8	0	72	136	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	9	0	78	148	22
Pedestrians	24			5	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	2			0	1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	268	188	194			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	268	188	194			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	702	833	1351			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	78	170
Volume Left	9	0	0
Volume Right	9	0	22
cSH	762	1351	1700
Volume to Capacity	0.02	0.00	0.10
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	9.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.8	0.0	0.0
Approach LOS	A		

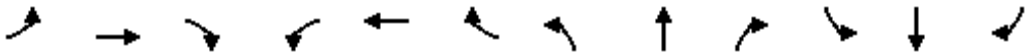
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	0	0	1	20	19	9	26	7	18	43	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	22	21	10	28	8	20	47	28
Pedestrians		75			31			31			28	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	286	261	167	214	272	91	150			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	286	261	167	214	272	91	150			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	96	98	99			99		
cM capacity (veh/h)	597	614	854	680	606	918	1431			1494		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	43	46	95
Volume Left	1	10	20
Volume Right	21	8	28
cSH	725	1431	1494
Volume to Capacity	0.06	0.01	0.01
Queue Length 95th (m)	1.5	0.2	0.3
Control Delay (s)	10.3	1.7	1.6
Lane LOS	B	A	A
Approach Delay (s)	10.3	1.7	1.6
Approach LOS	B		

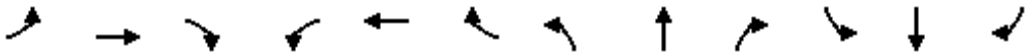
Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	29.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	6	11	4	2	31	12	6	15	1	3	13	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	4	2	34	13	7	16	1	3	14	8
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	142	139	108	141	142	61	71			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	142	139	108	141	142	61	71			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	100	95	99	100			100		
cM capacity (veh/h)	703	694	874	717	691	967	1466			1507		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	23	49	24	25
Volume Left	7	2	7	3
Volume Right	4	13	1	8
cSH	725	750	1466	1507
Volume to Capacity	0.03	0.07	0.00	0.00
Queue Length 95th (m)	0.7	1.6	0.1	0.0
Control Delay (s)	10.1	10.1	2.1	1.0
Lane LOS	B	B	A	A
Approach Delay (s)	10.1	10.1	2.1	1.0
Approach LOS	B	B		

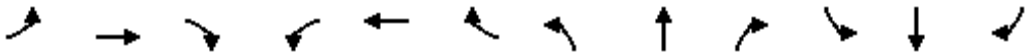
Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	2	44	0	4	0	0	0	41	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	48	0	4	0	0	0	45	26
Pedestrians		90			18			48			50	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	230	174	196	132	187	68	161			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230	174	196	132	187	68	161			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	93	100	100			100		
cM capacity (veh/h)	648	706	811	782	694	938	1418			1574		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	50	4	71
Volume Left	2	4	0
Volume Right	0	0	26
cSH	698	1418	1700
Volume to Capacity	0.07	0.00	0.04
Queue Length 95th (m)	1.8	0.1	0.0
Control Delay (s)	10.6	7.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	7.5	0.0
Approach LOS	B		

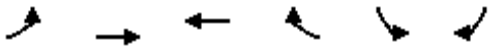
Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	31.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	11	0	9	3	2	3	11	208	7	60	302	26
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)	12	0	10	3	2	3	12	226	8	65	328	28
Pedestrians		85			165			17			83	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			14			1			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	899	980	444	918	991	478	442			399		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	890	979	396	911	990	478	393			399		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	98	98	99	99	99			93		
cM capacity (veh/h)	163	169	549	155	167	469	995			996		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	9	246	422
Volume Left	12	3	12	65
Volume Right	10	3	8	28
cSH	239	212	995	996
Volume to Capacity	0.09	0.04	0.01	0.07
Queue Length 95th (m)	2.3	1.0	0.3	1.6
Control Delay (s)	21.6	22.7	0.5	2.0
Lane LOS	C	C	A	A
Approach Delay (s)	21.6	22.7	0.5	2.0
Approach LOS	C	C		

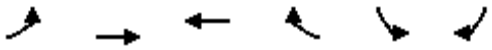
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	31	326	220	8	11	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	354	239	9	12	14
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		166				
pX, platoon unblocked						
vC, conflicting volume	279				756	387
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	279				756	387
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				96	98
cM capacity (veh/h)	1250				338	581

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	388	248	26
Volume Left	34	0	12
Volume Right	0	9	14
cSH	1250	1700	437
Volume to Capacity	0.03	0.15	0.06
Queue Length 95th (m)	0.6	0.0	1.4
Control Delay (s)	0.9	0.0	13.8
Lane LOS	A		B
Approach Delay (s)	0.9	0.0	13.8
Approach LOS			B

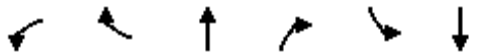
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	6	311	239	6	10	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	338	260	7	11	24
Pedestrians		100	100		50	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		9	9		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	316				764	413
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	316				764	413
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	96
cM capacity (veh/h)	1191				324	559

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	345	266	35
Volume Left	7	0	11
Volume Right	0	7	24
cSH	1191	1700	456
Volume to Capacity	0.01	0.16	0.08
Queue Length 95th (m)	0.1	0.0	1.9
Control Delay (s)	0.2	0.0	13.6
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	13.6
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	3	10	58	8	18	181
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	63	9	20	197
Pedestrians	20		32			18
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		3			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	355	105			92	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355	105			92	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	606	918			1477	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	72	216
Volume Left	3	0	20
Volume Right	11	9	0
cSH	821	1700	1477
Volume to Capacity	0.02	0.04	0.01
Queue Length 95th (m)	0.4	0.0	0.3
Control Delay (s)	9.5	0.0	0.8
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	0.8
Approach LOS	A		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

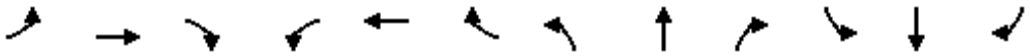
63: Queen St & Artillery Performance by approach

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.1	0.1	0.0	0.0	0.3
Delay / Veh (s)	1.4	2.4	4.2	4.0	1.9
Total Stops	13	18	18	11	60
Travel Dist (km)	42.4	9.8	3.0	1.7	57.0
Travel Time (hr)	1.4	0.3	0.1	0.1	1.9
Avg Speed (kph)	31	31	23	19	30
Vehicles Entered	370	99	29	25	523
Vehicles Exited	370	99	30	25	524
Hourly Exit Rate	370	99	30	25	524

177: Spring Garden Road & Brunswick Street Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.2	0.1	0.8	1.0
Delay / Veh (s)	1.5	1.2	14.9	4.4
Total Stops	46	18	160	224
Travel Dist (km)	17.2	18.8	9.0	45.0
Travel Time (hr)	0.6	0.6	1.1	2.2
Avg Speed (kph)	31	34	8	21
Vehicles Entered	371	266	189	826
Vehicles Exited	370	266	186	822
Hourly Exit Rate	370	266	186	822

Scenario A 2020 PM with background traffic growth



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.92		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	0.96	1.00			0.96		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1476	1547			1418		1594	1607		1412	1416	
Flt Permitted	0.45	1.00			0.90		0.15	1.00		0.30	1.00	
Satd. Flow (perm)	705	1547			1292		258	1607		450	1416	
Volume (vph)	446	284	32	16	109	76	53	319	31	85	170	410
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	474	326	44	36	122	85	68	389	44	99	189	519
RTOR Reduction (vph)	0	7	0	0	27	0	0	6	0	0	137	0
Lane Group Flow (vph)	474	363	0	0	216	0	68	427	0	99	571	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			20.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	38.0	38.0			22.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.53	0.53			0.31		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	501	816			395		93	580		163	511	
v/s Ratio Prot	c0.16	0.23						0.27			c0.40	
v/s Ratio Perm	c0.34				0.17		0.26			0.22		
v/c Ratio	0.95	0.45			0.55		0.73	0.74		0.61	1.12	
Uniform Delay, d1	15.5	10.5			20.8		20.0	20.0		18.8	23.0	
Progression Factor	1.00	1.00			1.23		1.00	1.00		0.89	0.75	
Incremental Delay, d2	28.8	1.8			5.3		39.6	8.1		14.3	74.1	
Delay (s)	44.3	12.3			31.0		59.6	28.1		31.1	91.3	
Level of Service	D	B			C		E	C		C	F	
Approach Delay (s)		30.3			31.0			32.4			83.9	
Approach LOS		C			C			C			F	

Intersection Summary			
HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	4%	
Volume (veh/h)	625	99	96	508	152	188
Peak Hour Factor	0.87	0.92	0.87	0.87	0.92	0.93
Hourly flow rate (vph)	718	108	110	584	165	202
Pedestrians	9			3	75	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			0	6	
Right turn flare (veh)						7
Median type					None	
Median storage veh)						
Upstream signal (m)	192			195		
pX, platoon unblocked			1.00		1.00	1.00
vC, conflicting volume			901		1369	850
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			901		1370	850
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		0	28
cM capacity (veh/h)			712		108	281

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	826	305	389	367
Volume Left	0	110	0	165
Volume Right	108	0	0	202
cSH	1700	712	1700	195
Volume to Capacity	0.49	0.15	0.23	1.88
Queue Length 95th (m)	0.0	4.1	0.0	202.6
Control Delay (s)	0.0	5.2	0.0	455.2
Lane LOS		A		F
Approach Delay (s)	0.0	2.3		455.2
Approach LOS				F

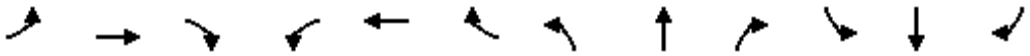
Intersection Summary			
Average Delay	89.4		
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	474	56	64	515	136	108
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	539	77	108	599	155	135
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			229		
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			650		1131	615
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			617		1144	578
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		0	67
cM capacity (veh/h)			849		148	405

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	615	308	399	290
Volume Left	0	108	0	155
Volume Right	77	0	0	135
cSH	1700	849	1700	211
Volume to Capacity	0.36	0.13	0.23	1.38
Queue Length 95th (m)	0.0	3.3	0.0	125.1
Control Delay (s)	0.0	4.4	0.0	239.5
Lane LOS		A		F
Approach Delay (s)	0.0	1.9		239.5
Approach LOS				F

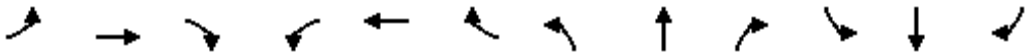
Intersection Summary			
Average Delay	43.9		
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	162	53	45	316	153	80	216	48	59	132	55
Peak Hour Factor	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Hourly flow rate (vph)	93	213	67	69	329	184	114	254	53	88	157	65

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	373	398	184	422	310
Volume Left (vph)	93	69	0	114	88
Volume Right (vph)	67	0	184	53	65
Hadj (s)	-0.02	0.12	-0.67	0.01	-0.03
Departure Headway (s)	9.1	9.3	8.5	8.9	9.3
Degree Utilization, x	0.94	1.03	0.43	1.05	0.80
Capacity (veh/h)	373	376	419	408	377
Control Delay (s)	62.6	82.7	16.6	87.8	41.2
Approach Delay (s)	62.6	61.8		87.8	41.2
Approach LOS	F	F		F	E

Intersection Summary				
Delay	64.7			
HCM Level of Service	F			
Intersection Capacity Utilization	71.8%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1728	1498		1858	1354	1668	1798	
Flt Permitted		0.97			0.74	1.00		0.97	1.00	0.19	1.00	
Satd. Flow (perm)		1918			1295	1498		1813	1354	332	1798	
Volume (vph)	12	175	50	96	214	391	30	541	169	246	250	16
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	188	54	97	216	395	31	564	176	251	255	16
RTOR Reduction (vph)	0	12	0	0	0	240	0	0	99	0	3	0
Lane Group Flow (vph)	0	243	0	0	313	155	0	595	77	251	268	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		21.0			21.0	21.0		32.0	32.0	45.0	45.0	
Effective Green, g (s)		24.0			24.0	24.0		35.0	35.0	48.0	48.0	
Actuated g/C Ratio		0.30			0.30	0.30		0.44	0.44	0.60	0.60	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		575			389	449		793	592	350	1079	
v/s Ratio Prot										c0.08	0.15	
v/s Ratio Perm		0.13			c0.24	0.10		0.33	0.06	c0.35		
v/c Ratio		0.42			0.80	0.34		0.75	0.13	0.72	0.25	
Uniform Delay, d1		22.4			25.8	21.9		18.8	13.4	12.1	7.5	
Progression Factor		1.00			1.00	1.00		0.71	0.99	1.00	1.00	
Incremental Delay, d2		2.3			16.1	2.1		4.6	0.3	11.9	0.6	
Delay (s)		24.7			41.9	24.0		17.9	13.6	24.0	8.1	
Level of Service		C			D	C		B	B	C	A	
Approach Delay (s)		24.7			31.9			16.9			15.7	
Approach LOS		C			C			B			B	

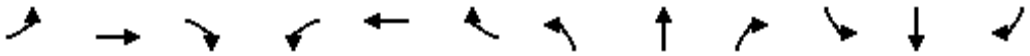
Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.95			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Satd. Flow (prot)	1690	1694		1668	1892	1316		3145			3408	1386
Flt Permitted	0.36	1.00		0.34	1.00	1.00		0.78			0.62	1.00
Satd. Flow (perm)	633	1694		599	1892	1316		2474			2132	1386
Volume (vph)	83	228	97	84	398	75	124	478	106	62	207	46
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	108	281	143	99	410	95	170	525	143	103	233	54
RTOR Reduction (vph)	0	23	0	0	0	45	0	22	0	0	0	27
Lane Group Flow (vph)	108	401	0	99	410	50	0	817	0	0	336	27
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	253	678		240	757	526		1237			1066	693
v/s Ratio Prot		c0.24			0.22							
v/s Ratio Perm	0.17			0.17		0.04		c0.33			0.16	0.02
v/c Ratio	0.43	0.59		0.41	0.54	0.10		0.66			0.32	0.04
Uniform Delay, d1	17.4	18.9		17.2	18.4	15.0		14.9			11.9	10.2
Progression Factor	1.01	1.01		1.00	1.00	1.00		0.87			0.89	0.85
Incremental Delay, d2	5.2	3.8		5.2	2.8	0.4		2.3			0.8	0.1
Delay (s)	22.7	22.8		22.4	21.2	15.3		15.3			11.3	8.8
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		22.8			20.4			15.3			10.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

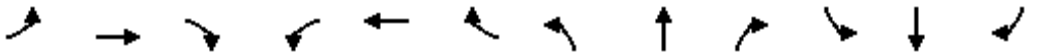
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	0	0	7	80	35	10	52	8	25	58	56
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	8	87	38	11	57	9	27	63	61
Pedestrians		45			51			36			74	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	431	331	174	317	357	186	169			116		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	431	331	174	317	357	186	169			116		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	84	95	99			98		
cM capacity (veh/h)	394	548	842	558	530	767	1409			1408		

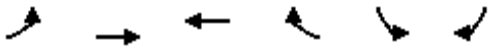
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	133	76	151
Volume Left	8	11	27
Volume Right	38	9	61
cSH	583	1409	1408
Volume to Capacity	0.23	0.01	0.02
Queue Length 95th (m)	6.6	0.2	0.4
Control Delay (s)	13.0	1.1	1.5
Lane LOS	B	A	A
Approach Delay (s)	13.0	1.1	1.5
Approach LOS	B		

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	32.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.89		1.00	1.00	0.56
Flpb, ped/bikes	0.81	1.00	1.00		0.95	1.00	0.77	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1317	1448	354		1522	684	1343	1586		1723	1739	855
Flt Permitted	0.40	1.00	1.00		0.94	1.00	0.53	1.00		0.24	1.00	1.00
Satd. Flow (perm)	548	1448	354		1434	684	744	1586		435	1739	855
Volume (vph)	71	224	53	31	225	111	90	551	82	80	279	67
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	76	252	63	40	300	131	108	580	102	103	310	81
RTOR Reduction (vph)	0	0	41	0	0	20	0	6	0	0	0	0
Lane Group Flow (vph)	76	252	22	0	340	111	108	676	0	103	310	81
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	25.0	25.0	25.0		25.0	25.0	41.0	41.0		41.0	41.0	41.0
Effective Green, g (s)	28.0	28.0	28.0		28.0	28.0	44.0	44.0		44.0	44.0	44.0
Actuated g/C Ratio	0.35	0.35	0.35		0.35	0.35	0.55	0.55		0.55	0.55	0.55
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	192	507	124		502	239	409	872		239	956	470
v/s Ratio Prot		0.17						c0.43			0.18	
v/s Ratio Perm	0.14		0.06		c0.24	0.16	0.15			0.24		0.09
v/c Ratio	0.40	0.50	0.18		0.68	0.46	0.26	0.77		0.43	0.32	0.17
Uniform Delay, d1	19.6	20.5	18.0		22.2	20.2	9.5	14.1		10.6	9.9	8.9
Progression Factor	1.02	0.96	1.33		0.77	0.72	1.12	1.22		0.76	0.76	0.74
Incremental Delay, d2	5.3	3.1	2.7		6.8	6.0	1.5	6.3		5.4	0.9	0.8
Delay (s)	25.3	22.7	26.7		23.9	20.5	12.1	23.6		13.4	8.3	7.4
Level of Service	C	C	C		C	C	B	C		B	A	A
Approach Delay (s)		23.9			23.0			22.0			9.2	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



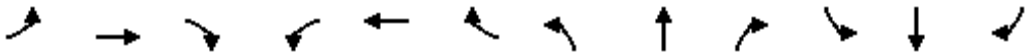
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	13	274	472	8	26	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	298	513	9	28	40
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	606				930	601
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	606				930	601
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				90	91
cM capacity (veh/h)	902				270	464

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	312	522	68
Volume Left	14	0	28
Volume Right	0	9	40
cSH	902	1700	358
Volume to Capacity	0.02	0.31	0.19
Queue Length 95th (m)	0.4	0.0	5.3
Control Delay (s)	0.6	0.0	17.4
Lane LOS	A		C
Approach Delay (s)	0.6	0.0	17.4
Approach LOS			C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.85		1.00	0.91			0.85			0.73	
Flpb, ped/bikes	0.65	1.00		0.61	1.00			0.93			0.94	
Frt	1.00	0.97		1.00	0.99			0.97			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1087	1252		962	1450			1551			1370	
Flt Permitted	0.46	1.00		0.48	1.00			0.90			0.95	
Satd. Flow (perm)	526	1252		489	1450			1415			1306	
Volume (vph)	21	258	36	20	295	25	28	82	19	12	64	73
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	26	287	58	36	335	36	36	85	36	31	94	91
RTOR Reduction (vph)	0	9	0	0	5	0	0	13	0	0	6	0
Lane Group Flow (vph)	26	336	0	36	366	0	0	144	0	0	210	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	39.0	39.0		39.0	39.0			29.0			29.0	
Effective Green, g (s)	41.0	41.0		41.0	41.0			31.0			31.0	
Actuated g/C Ratio	0.51	0.51		0.51	0.51			0.39			0.39	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	270	642		251	743			548			506	
v/s Ratio Prot		c0.27			0.25							
v/s Ratio Perm	0.05			0.07				0.10			c0.16	
v/c Ratio	0.10	0.52		0.14	0.49			0.26			0.42	
Uniform Delay, d1	10.0	13.0		10.3	12.7			16.7			17.9	
Progression Factor	0.98	1.07		0.77	0.75			0.99			0.98	
Incremental Delay, d2	0.6	2.6		1.1	2.1			1.2			2.5	
Delay (s)	10.4	16.5		9.0	11.6			17.6			20.0	
Level of Service	B	B		A	B			B			B	
Approach Delay (s)		16.1			11.4			17.6			20.0	
Approach LOS		B			B			B			B	

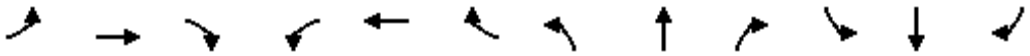
Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			1%			2%			-4%	
Volume (veh/h)	15	296	15	19	315	24	9	21	47	2	8	28
Peak Hour Factor	0.81	0.91	0.68	0.71	0.84	0.76	0.75	0.95	0.75	0.50	0.74	0.78
Hourly flow rate (vph)	19	325	22	27	375	32	12	22	63	4	11	36
Pedestrians		122			22			297			436	
Lane Width (m)		3.0			3.0			3.9			4.8	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			27			48	
Right turn flare (veh)									4			
Median type								None			None	
Median storage veh)												
Upstream signal (m)		80			81							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	843			644			1262	1566	655	1307	1562	949
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	824			644			1293	1633	655	1343	1628	943
tC, single (s)	4.2			4.1			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	95			96			44	30	81	62	66	74
cM capacity (veh/h)	362			696			21	31	338	10	32	136

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	19	347	27	407	97	51
Volume Left	19	0	27	0	12	4
Volume Right	0	22	0	32	63	36
cSH	362	1700	696	1700	77	51
Volume to Capacity	0.05	0.20	0.04	0.24	1.26	0.99
Queue Length 95th (m)	1.2	0.0	0.9	0.0	56.4	32.8
Control Delay (s)	15.5	0.0	10.4	0.0	285.3	248.2
Lane LOS	C		B		F	F
Approach Delay (s)	0.8		0.6		285.3	248.2
Approach LOS					F	F

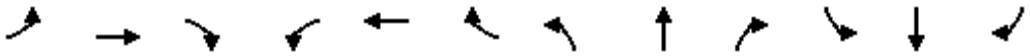
Intersection Summary			
Average Delay	43.1		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	11	25	6	8	84	13	10	21	11	15	19	26
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)	12	27	7	9	91	14	11	23	12	16	21	28
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	321	258	158	245	266	156	124			94		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321	258	158	245	266	156	124			94		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	95	99	98	84	98	99			99		
cM capacity (veh/h)	432	563	796	556	557	796	1369			1425		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	46	114	46	65
Volume Left	12	9	11	16
Volume Right	7	14	12	28
cSH	543	579	1369	1425
Volume to Capacity	0.08	0.20	0.01	0.01
Queue Length 95th (m)	2.1	5.5	0.2	0.3
Control Delay (s)	12.2	12.7	1.9	2.0
Lane LOS	B	B	A	A
Approach Delay (s)	12.2	12.7	1.9	2.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.90		1.00	0.94		1.00	0.83			0.89	
Flpb, ped/bikes		0.97		0.57	1.00		0.61	1.00			1.00	
Frt		0.98		1.00	0.99		1.00	0.94			0.98	
Flt Protected		1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		2462		953	1476		997	1471			1643	
Flt Permitted		0.90		0.52	1.00		0.63	1.00			0.98	
Satd. Flow (perm)		2215		518	1476		661	1471			1615	
Volume (vph)	34	270	36	85	277	26	103	267	176	6	130	27
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	37	287	49	121	322	28	143	290	189	7	141	29
RTOR Reduction (vph)	0	15	0	0	4	0	0	25	0	0	9	0
Lane Group Flow (vph)	0	358	0	121	346	0	143	454	0	0	168	0
Confl. Peds. (#/hr)	435		420	420		435	271		340	340		271
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		37.0		37.0	37.0		31.0	31.0			31.0	
Effective Green, g (s)		39.0		39.0	39.0		33.0	33.0			33.0	
Actuated g/C Ratio		0.49		0.49	0.49		0.41	0.41			0.41	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1080		253	720		273	607			666	
v/s Ratio Prot					c0.23			c0.31				
v/s Ratio Perm		0.16		0.23			0.22				0.10	
v/c Ratio		0.33		0.48	0.48		0.52	0.75			0.25	
Uniform Delay, d1		12.5		13.7	13.7		17.6	20.0			15.4	
Progression Factor		0.80		1.00	1.00		1.00	1.00			1.02	
Incremental Delay, d2		0.8		6.3	2.3		7.0	8.2			0.9	
Delay (s)		10.8		20.1	16.0		24.6	28.2			16.7	
Level of Service		B		C	B		C	C			B	
Approach Delay (s)		10.8			17.0			27.3			16.7	
Approach LOS		B			B			C			B	

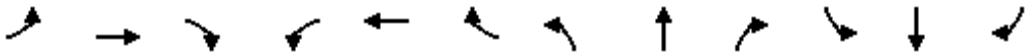
Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	366	77	37	334	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	398	84	40	363	0	0
Pedestrians	591				630	
Lane Width (m)	3.0				0.0	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	41				0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.89		0.94	0.89
vC, conflicting volume			1112		2104	1070
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1125		2001	1078
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	100
cM capacity (veh/h)			552		34	236

Direction, Lane #	EB 1	WB 1
Volume Total	482	403
Volume Left	0	40
Volume Right	84	0
cSH	1700	552
Volume to Capacity	0.28	0.07
Queue Length 95th (m)	0.0	1.8
Control Delay (s)	0.0	2.2
Lane LOS		A
Approach Delay (s)	0.0	2.2
Approach LOS		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	11	131	0	48	0	0	0	31	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	12	142	0	52	0	0	0	34	80
Pedestrians		28			32			60			84	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	361	238	162	270	278	116	142			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	361	238	162	270	278	116	142			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	76	100	96			100		
cM capacity (veh/h)	428	621	838	599	590	845	1441			1537		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	154	52	114
Volume Left	12	52	0
Volume Right	0	0	80
cSH	591	1441	1700
Volume to Capacity	0.26	0.04	0.07
Queue Length 95th (m)	7.9	0.9	0.0
Control Delay (s)	13.2	7.6	0.0
Lane LOS	B	A	
Approach Delay (s)	13.2	7.6	0.0
Approach LOS	B		

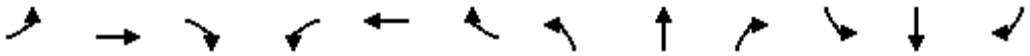
Intersection Summary				
Average Delay	7.6			
Intersection Capacity Utilization	31.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	39	265	530	0	0	276
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	288	576	0	0	300
Pedestrians	52		163			169
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.85	0.84			0.84	
vC, conflicting volume	1091	797			628	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1076	759			558	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	0			100	
cM capacity (veh/h)	170	279			814	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	42	288	576	300
Volume Left	42	0	0	0
Volume Right	0	288	0	0
cSH	170	279	1700	1700
Volume to Capacity	0.25	1.03	0.34	0.18
Queue Length 95th (m)	7.2	83.2	0.0	0.0
Control Delay (s)	33.1	102.4	0.0	0.0
Lane LOS	D	F		
Approach Delay (s)	93.5		0.0	0.0
Approach LOS	F			

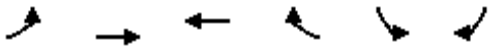
Intersection Summary			
Average Delay	25.6		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	27	4	17	2	22	48	38	424	1	2	181	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	4	18	2	24	52	41	461	1	2	197	70
Pedestrians		94			157			19			78	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			13			2			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	1016	1031	345	977	1066	696	360			619		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1016	1031	345	977	1066	696	360			619		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	98	97	99	86	85	96			100		
cM capacity (veh/h)	116	178	632	153	170	357	1102			832		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	52	78	503	268
Volume Left	29	2	41	2
Volume Right	18	52	1	70
cSH	170	260	1102	832
Volume to Capacity	0.31	0.30	0.04	0.00
Queue Length 95th (m)	9.3	9.3	0.9	0.1
Control Delay (s)	35.2	24.7	1.1	0.1
Lane LOS	E	C	A	A
Approach Delay (s)	35.2	24.7	1.1	0.1
Approach LOS	E	C		

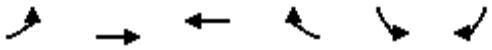
Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	45	280	442	7	20	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	304	480	8	22	32
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		168				
pX, platoon unblocked						
vC, conflicting volume	519				977	628
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	519				977	628
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				91	93
cM capacity (veh/h)	1019				244	424

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	353	488	53
Volume Left	49	0	22
Volume Right	0	8	32
cSH	1019	1700	326
Volume to Capacity	0.05	0.29	0.16
Queue Length 95th (m)	1.1	0.0	4.4
Control Delay (s)	1.6	0.0	18.2
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	18.2
Approach LOS			C

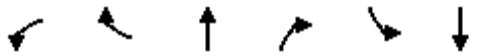
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	29	239	431	11	6	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	260	468	12	7	37
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	529				945	656
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	529				945	656
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				97	91
cM capacity (veh/h)	994				247	395

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	291	480	43
Volume Left	32	0	7
Volume Right	0	12	37
cSH	994	1700	362
Volume to Capacity	0.03	0.28	0.12
Queue Length 95th (m)	0.7	0.0	3.1
Control Delay (s)	1.2	0.0	16.3
Lane LOS	A		C
Approach Delay (s)	1.2	0.0	16.3
Approach LOS			C

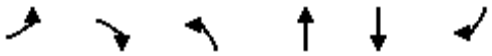
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	27	24	125	29	38	193
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	26	136	32	41	210
Pedestrians	102		74			46
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	9		6			4
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	620	300			269	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	620	300			269	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			97	
cM capacity (veh/h)	373	649			1181	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	55	167	251
Volume Left	29	0	41
Volume Right	26	32	0
cSH	466	1700	1181
Volume to Capacity	0.12	0.10	0.03
Queue Length 95th (m)	3.1	0.0	0.8
Control Delay (s)	13.8	0.0	1.6
Lane LOS	B		A
Approach Delay (s)	13.8	0.0	1.6
Approach LOS	B		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	85	18	4	267	127	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	20	4	290	138	63
Pedestrians	95			14	26	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	8			1	2	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	589	279	296			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	589	279	296			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	97	100			
cM capacity (veh/h)	421	690	1162			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	112	295	201
Volume Left	92	4	0
Volume Right	20	0	63
cSH	452	1162	1700
Volume to Capacity	0.25	0.00	0.12
Queue Length 95th (m)	7.3	0.1	0.0
Control Delay (s)	15.6	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	15.6	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	29	27	225	84	37	133
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	29	245	91	40	145
Pedestrians	75		75			81
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		6			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			59			
pX, platoon unblocked						
vC, conflicting volume	665	446			411	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	665	446			411	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	94			96	
cM capacity (veh/h)	358	533			1074	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	61	336	185
Volume Left	32	0	40
Volume Right	29	91	0
cSH	425	1700	1074
Volume to Capacity	0.14	0.20	0.04
Queue Length 95th (m)	3.8	0.0	0.9
Control Delay (s)	14.9	0.0	2.1
Lane LOS	B		A
Approach Delay (s)	14.9	0.0	2.1
Approach LOS	B		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

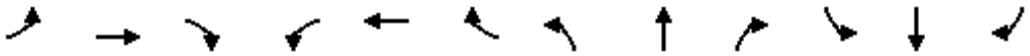
174: Queen Street & Birmingham Street Performance by approach

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.1	0.2	0.3	0.1	0.7
Delay / Veh (s)	1.6	3.9	10.0	3.6	3.9
Total Stops	35	20	105	25	185
Travel Dist (km)	26.9	19.5	8.4	4.0	58.8
Travel Time (hr)	0.9	0.7	0.6	0.2	2.4
Avg Speed (kph)	30	30	15	18	25
Vehicles Entered	261	194	106	60	621
Vehicles Exited	263	193	105	60	621
Hourly Exit Rate	263	193	105	60	621

177: Spring Garden Road & Brunswick Street Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.6	0.5	1.2	2.3
Delay / Veh (s)	5.2	3.6	35.2	8.2
Total Stops	127	92	107	326
Travel Dist (km)	19.9	33.4	6.6	59.9
Travel Time (hr)	1.1	1.4	1.5	4.0
Avg Speed (kph)	18	26	5	16
Vehicles Entered	428	451	128	1007
Vehicles Exited	428	451	124	1003
Hourly Exit Rate	428	451	124	1003

Scenario B 2020 AM with background traffic growth



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.94		1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1456	1608			1514		1626	1624		1473	1494	
Flt Permitted	0.63	1.00			0.90		0.15	1.00		0.54	1.00	
Satd. Flow (perm)	969	1608			1378		263	1624		840	1494	
Volume (vph)	248	328	35	7	35	34	9	161	25	224	271	484
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	273	349	50	18	41	41	18	201	36	238	327	563
RTOR Reduction (vph)	0	7	0	0	28	0	0	9	0	0	86	0
Lane Group Flow (vph)	273	392	0	0	72	0	18	228	0	238	804	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			20.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	38.0	38.0			22.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.53	0.53			0.31		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	593	849			421		95	586		303	540	
v/s Ratio Prot	0.08	c0.24						0.14			c0.54	
v/s Ratio Perm	0.17				0.05		0.07			0.28		
v/c Ratio	0.46	0.46			0.17		0.19	0.39		0.79	1.49	
Uniform Delay, d1	10.2	10.6			18.3		15.8	17.1		20.5	23.0	
Progression Factor	1.00	1.00			1.48		1.01	1.02		1.12	1.04	
Incremental Delay, d2	2.6	1.8			0.9		4.4	1.9		14.3	227.2	
Delay (s)	12.7	12.4			27.9		20.3	19.4		37.2	251.1	
Level of Service	B	B			C		C	B		D	F	
Approach Delay (s)		12.5			27.9			19.4			206.0	
Approach LOS		B			C			B			F	

Intersection Summary			
HCM Average Control Delay	115.3	HCM Level of Service	F
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	4%	
Volume (veh/h)	535	184	139	411	38	82
Peak Hour Factor	0.91	0.82	0.87	0.82	0.85	0.88
Hourly flow rate (vph)	588	224	160	501	45	93
Pedestrians	4			5	44	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	4	
Right turn flare (veh)						7
Median type					None	
Median storage veh)						
Upstream signal (m)	192			195		
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			856		1318	749
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			840		1354	721
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			77		53	71
cM capacity (veh/h)			683		94	322

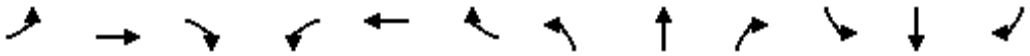
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	812	327	334	138
Volume Left	0	160	0	45
Volume Right	224	0	0	93
cSH	1700	683	1700	291
Volume to Capacity	0.48	0.23	0.20	0.47
Queue Length 95th (m)	0.0	6.9	0.0	18.3
Control Delay (s)	0.0	7.4	0.0	37.9
Lane LOS		A		E
Approach Delay (s)	0.0	3.6		37.9
Approach LOS				E

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	829	153	119	384	36	27
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	855	158	135	436	43	33
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			229		
pX, platoon unblocked			0.75		0.75	0.75
vC, conflicting volume			1047		1459	977
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1063		1614	969
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			71		11	82
cM capacity (veh/h)			473		49	182

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1012	281	291	76
Volume Left	0	135	0	43
Volume Right	158	0	0	33
cSH	1700	473	1700	71
Volume to Capacity	0.60	0.29	0.17	1.07
Queue Length 95th (m)	0.0	8.9	0.0	42.9
Control Delay (s)	0.0	10.1	0.0	227.5
Lane LOS		B		F
Approach Delay (s)	0.0	4.9		227.5
Approach LOS				F

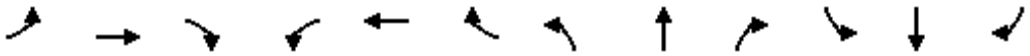
Intersection Summary			
Average Delay	12.1		
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	60	216	49	44	137	43	36	134	54	136	166	34
Peak Hour Factor	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Hourly flow rate (vph)	62	223	51	47	146	46	40	151	61	143	175	36

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	335	193	46	252	354
Volume Left (vph)	62	47	0	40	143
Volume Right (vph)	51	0	46	61	36
Hadj (s)	-0.02	0.16	-0.67	-0.08	0.05
Departure Headway (s)	6.6	7.5	6.6	6.6	6.5
Degree Utilization, x	0.62	0.40	0.08	0.46	0.64
Capacity (veh/h)	501	427	478	484	510
Control Delay (s)	19.7	14.1	9.0	15.3	20.3
Approach Delay (s)	19.7	13.1		15.3	20.3
Approach LOS	C	B		C	C

Intersection Summary				
Delay	17.6			
HCM Level of Service	C			
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1997			1712	1502		1859	1350	1634	1812	
Flt Permitted		0.98			0.65	1.00		0.97	1.00	0.37	1.00	
Satd. Flow (perm)		1962			1136	1502		1815	1350	632	1812	
Volume (vph)	11	206	39	109	161	132	12	243	115	463	339	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	224	42	115	169	139	13	270	128	503	368	7
RTOR Reduction (vph)	0	8	0	0	0	96	0	0	90	0	1	0
Lane Group Flow (vph)	0	270	0	0	284	43	0	283	38	503	374	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		21.0	21.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		24.0	24.0	47.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.30	0.30	0.59	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		613			355	469		545	405	609	1065	
v/s Ratio Prot										c0.20	0.21	
v/s Ratio Perm		0.14			c0.25	0.03		0.16	0.03	c0.29		
v/c Ratio		0.44			0.80	0.09		0.52	0.09	0.83	0.35	
Uniform Delay, d1		21.9			25.2	19.5		23.2	20.2	11.2	8.6	
Progression Factor		1.00			1.00	1.00		0.88	1.24	1.00	1.00	
Incremental Delay, d2		2.3			17.1	0.4		2.9	0.4	12.1	0.9	
Delay (s)		24.2			42.3	19.9		23.3	25.5	23.3	9.5	
Level of Service		C			D	B		C	C	C	A	
Approach Delay (s)		24.2			34.9			24.0			17.4	
Approach LOS		C			C			C			B	

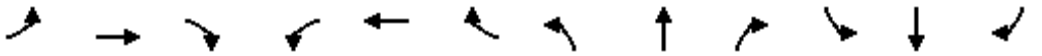
Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1589	1652		1677	1874	1369		3234			3480	1527
Flt Permitted	0.58	1.00		0.32	1.00	1.00		0.67			0.67	1.00
Satd. Flow (perm)	978	1652		562	1874	1369		2189			2345	1527
Volume (vph)	40	200	188	55	176	35	97	311	91	106	353	41
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	238	219	62	210	49	156	389	99	129	430	76
RTOR Reduction (vph)	0	41	0	0	0	29	0	18	0	0	0	39
Lane Group Flow (vph)	49	416	0	62	210	20	0	626	0	0	559	37
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	403	681		232	773	565		1067			1143	744
v/s Ratio Prot		c0.25			0.11							
v/s Ratio Perm	0.05			0.11		0.01		c0.29			0.24	0.02
v/c Ratio	0.12	0.61		0.27	0.27	0.04		0.59			0.49	0.05
Uniform Delay, d1	14.5	18.5		15.5	15.5	14.0		14.7			13.8	10.8
Progression Factor	0.97	0.92		1.00	1.00	1.00		0.65			0.84	0.61
Incremental Delay, d2	0.6	3.9		2.8	0.9	0.1		2.1			1.4	0.1
Delay (s)	14.6	20.8		18.3	16.4	14.1		11.7			12.9	6.7
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		20.2			16.4			11.7			12.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.91		1.00	1.00	0.68
Flpb, ped/bikes	0.75	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1203	1564	545		1310	802	1658	1615		1790	1773	1021
Flt Permitted	0.55	1.00	1.00		0.92	1.00	0.38	1.00		0.32	1.00	1.00
Satd. Flow (perm)	693	1564	545		1209	802	654	1615		609	1773	1021
Volume (vph)	80	193	93	35	174	67	39	395	56	68	396	49
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	131	230	112	41	193	81	53	454	81	101	471	53
RTOR Reduction (vph)	0	0	69	0	0	50	0	8	0	0	0	20
Lane Group Flow (vph)	131	230	43	0	234	31	53	527	0	101	471	33
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	28.0	28.0	28.0		28.0	28.0	38.0	38.0		38.0	38.0	38.0
Effective Green, g (s)	31.0	31.0	31.0		31.0	31.0	41.0	41.0		41.0	41.0	41.0
Actuated g/C Ratio	0.39	0.39	0.39		0.39	0.39	0.51	0.51		0.51	0.51	0.51
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	269	606	211		468	311	335	828		312	909	523
v/s Ratio Prot		0.15						c0.33			0.27	
v/s Ratio Perm	0.19		0.08		c0.19	0.04	0.08			0.17		0.03
v/c Ratio	0.49	0.38	0.21		0.50	0.10	0.16	0.64		0.32	0.52	0.06
Uniform Delay, d1	18.5	17.6	16.3		18.6	15.6	10.3	14.1		11.4	12.9	9.8
Progression Factor	1.00	1.00	1.00		0.73	0.43	1.07	1.25		0.76	0.78	0.60
Incremental Delay, d2	6.2	1.8	2.2		3.7	0.6	0.9	3.5		2.6	2.0	0.2
Delay (s)	24.7	19.4	18.5		17.3	7.3	12.0	21.1		11.2	12.1	6.1
Level of Service	C	B	B		B	A	B	C		B	B	A
Approach Delay (s)		20.6			14.8			20.3			11.4	
Approach LOS		C			B			C			B	

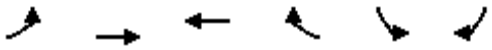
Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	16	60	421	0	0	484
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	65	458	0	0	526
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.92	0.88			0.88	
vC, conflicting volume	1190	615			530	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1004	560			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	84			100	
cM capacity (veh/h)	204	402			903	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	17	65	458	526
Volume Left	17	0	0	0
Volume Right	0	65	0	0
cSH	204	402	1700	1700
Volume to Capacity	0.09	0.16	0.27	0.31
Queue Length 95th (m)	2.1	4.4	0.0	0.0
Control Delay (s)	24.3	15.7	0.0	0.0
Lane LOS	C	C		
Approach Delay (s)	17.5		0.0	0.0
Approach LOS	C			

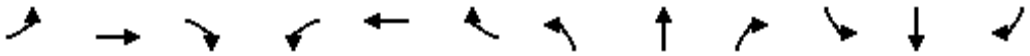
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	8	342	236	4	20	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	372	257	4	22	11
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	345				735	343
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	345				735	343
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	1127				355	650

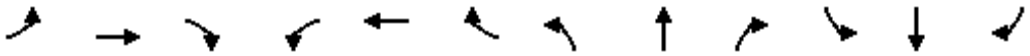
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	380	261	33
Volume Left	9	0	22
Volume Right	0	4	11
cSH	1127	1700	419
Volume to Capacity	0.01	0.15	0.08
Queue Length 95th (m)	0.2	0.0	1.9
Control Delay (s)	0.3	0.0	14.3
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	14.3
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.91			0.92			0.87			0.79	
Flpb, ped/bikes		1.00			1.00			0.96			0.94	
Frt		0.98			0.98			0.97			0.95	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		1425			1272			1684			1503	
Flt Permitted		1.00			1.00			0.96			0.96	
Satd. Flow (perm)		1425			1272			1626			1457	
Volume (vph)	0	262	39	0	193	20	3	27	10	20	73	55
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	0	312	53	0	224	27	8	31	13	27	95	76
RTOR Reduction (vph)	0	8	0	0	5	0	0	8	0	0	28	0
Lane Group Flow (vph)	0	357	0	0	246	0	0	44	0	0	170	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		40.0			40.0			28.0			28.0	
Effective Green, g (s)		42.0			42.0			30.0			30.0	
Actuated g/C Ratio		0.52			0.52			0.38			0.38	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		748			668			610			546	
v/s Ratio Prot		c0.25			0.19							
v/s Ratio Perm								0.03			c0.12	
v/c Ratio		0.48			0.37			0.07			0.31	
Uniform Delay, d1		12.0			11.2			16.1			17.7	
Progression Factor		0.77			0.69			0.93			0.97	
Incremental Delay, d2		2.0			1.5			0.2			1.5	
Delay (s)		11.3			9.3			15.1			18.7	
Level of Service		B			A			B			B	
Approach Delay (s)		11.3			9.3			15.1			18.7	
Approach LOS		B			A			B			B	

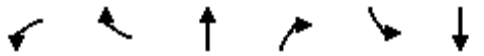
Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			1%			2%			-4%	
Volume (veh/h)	15	267	7	11	193	16	4	6	9	6	12	8
Peak Hour Factor	0.65	0.92	0.38	0.83	0.75	0.88	0.33	0.50	0.67	0.42	0.92	0.58
Hourly flow rate (vph)	23	290	18	13	257	18	12	12	13	14	13	14
Pedestrians		96			2			324			324	
Lane Width (m)		3.0			3.0			3.9			4.8	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			0			29			36	
Right turn flare (veh)									4			
Median type								None			None	
Median storage veh)												
Upstream signal (m)		80			81							
pX, platoon unblocked	0.96			0.92			0.94	0.94	0.92	0.94	0.94	0.96
vC, conflicting volume	600			633			1070	1296	625	968	1296	686
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	583			603			1009	1248	595	902	1248	673
tC, single (s)	4.1			4.2			7.1	6.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	96			98			80	83	96	80	82	95
cM capacity (veh/h)	615			622			62	70	303	73	71	263

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	23	309	13	276	38	41
Volume Left	23	0	13	0	12	14
Volume Right	0	18	0	18	13	14
cSH	615	1700	622	1700	103	95
Volume to Capacity	0.04	0.18	0.02	0.16	0.36	0.43
Queue Length 95th (m)	0.9	0.0	0.5	0.0	11.1	13.8
Control Delay (s)	11.1	0.0	10.9	0.0	62.7	69.4
Lane LOS	B		B		F	F
Approach Delay (s)	0.8		0.5		62.7	69.4
Approach LOS					F	F

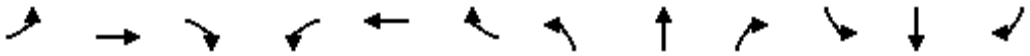
Intersection Summary				
Average Delay	8.0			
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	46	17	86	15	17	261
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	18	93	16	18	284
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			61			
pX, platoon unblocked						
vC, conflicting volume	467	148			131	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	467	148			131	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	98			99	
cM capacity (veh/h)	526	864			1428	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	110	302
Volume Left	50	0	18
Volume Right	18	16	0
cSH	588	1700	1428
Volume to Capacity	0.12	0.06	0.01
Queue Length 95th (m)	3.0	0.0	0.3
Control Delay (s)	11.9	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	11.9	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.91		1.00	0.98		1.00	0.80			0.96	
Flpb, ped/bikes		0.94		0.67	1.00		1.00	1.00			0.99	
Frt		0.98		1.00	0.99		1.00	0.91			0.99	
Flt Protected		0.99		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		2560		1109	1400		1503	1368			1990	
Flt Permitted		0.88		0.52	1.00		0.45	1.00			0.97	
Satd. Flow (perm)		2270		604	1400		709	1368			1933	
Volume (vph)	32	221	45	140	225	7	30	84	115	12	225	25
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	53	276	58	177	250	9	36	94	151	22	256	31
RTOR Reduction (vph)	0	18	0	0	2	0	0	72	0	0	5	0
Lane Group Flow (vph)	0	369	0	177	257	0	36	173	0	0	304	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		43.0		43.0	43.0		25.0	25.0			25.0	
Effective Green, g (s)		45.0		45.0	45.0		27.0	27.0			27.0	
Actuated g/C Ratio		0.56		0.56	0.56		0.34	0.34			0.34	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1277		340	788		239	462			652	
v/s Ratio Prot					0.18			0.13				
v/s Ratio Perm		0.16		c0.29			0.05				c0.16	
v/c Ratio		0.29		0.52	0.33		0.15	0.37			0.47	
Uniform Delay, d1		9.1		10.8	9.4		18.5	20.1			20.8	
Progression Factor		0.79		1.00	1.00		1.00	1.00			1.13	
Incremental Delay, d2		0.5		5.6	1.1		1.3	2.3			2.3	
Delay (s)		7.7		16.4	10.5		19.8	22.4			25.9	
Level of Service		A		B	B		B	C			C	
Approach Delay (s)		7.7			12.9			22.1			25.9	
Approach LOS		A			B			C			C	

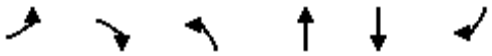
Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	315	46	19	222	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	342	50	21	241	0	0
Pedestrians	300				200	
Lane Width (m)	3.0				0.0	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	21				0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			592		1150	567
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			556		1163	529
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			932		153	505

Direction, Lane #	EB 1	WB 1
Volume Total	392	262
Volume Left	0	21
Volume Right	50	0
cSH	1700	932
Volume to Capacity	0.23	0.02
Queue Length 95th (m)	0.0	0.5
Control Delay (s)	0.0	0.9
Lane LOS		A
Approach Delay (s)	0.0	0.9
Approach LOS		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	8	8	0	72	136	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	9	0	78	148	22
Pedestrians	24			5	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	2			0	1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	268	188	194			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	268	188	194			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	702	833	1351			

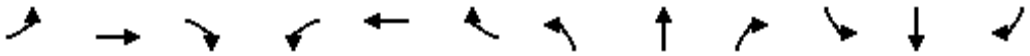
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	78	170
Volume Left	9	0	0
Volume Right	9	0	22
cSH	762	1351	1700
Volume to Capacity	0.02	0.00	0.10
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	9.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.8	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	0	0	1	20	19	9	26	7	18	43	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	1	22	21	10	28	8	20	47	28
Pedestrians		75			31			31			28	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	286	261	167	214	272	91	150			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	286	261	167	214	272	91	150			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	96	98	99			99		
cM capacity (veh/h)	597	614	854	680	606	918	1431			1494		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	43	46	95
Volume Left	1	10	20
Volume Right	21	8	28
cSH	725	1431	1494
Volume to Capacity	0.06	0.01	0.01
Queue Length 95th (m)	1.5	0.2	0.3
Control Delay (s)	10.3	1.7	1.6
Lane LOS	B	A	A
Approach Delay (s)	10.3	1.7	1.6
Approach LOS	B		

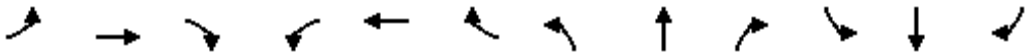
Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	29.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	6	11	4	2	45	12	6	15	1	3	13	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	12	4	2	49	13	7	16	1	3	14	8
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	150	139	108	141	142	61	71			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150	139	108	141	142	61	71			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	100	93	99	100			100		
cM capacity (veh/h)	683	694	874	717	691	967	1466			1507		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	23	64	24	25
Volume Left	7	2	7	3
Volume Right	4	13	1	8
cSH	719	735	1466	1507
Volume to Capacity	0.03	0.09	0.00	0.00
Queue Length 95th (m)	0.7	2.2	0.1	0.0
Control Delay (s)	10.2	10.4	2.1	1.0
Lane LOS	B	B	A	A
Approach Delay (s)	10.2	10.4	2.1	1.0
Approach LOS	B	B		

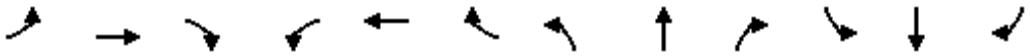
Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	2	44	0	4	0	0	0	41	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	48	0	4	0	0	0	45	26
Pedestrians		90			18			48			50	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	230	174	196	132	187	68	161			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230	174	196	132	187	68	161			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	93	100	100			100		
cM capacity (veh/h)	648	706	811	782	694	938	1418			1574		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	50	4	71
Volume Left	2	4	0
Volume Right	0	0	26
cSH	698	1418	1700
Volume to Capacity	0.07	0.00	0.04
Queue Length 95th (m)	1.8	0.1	0.0
Control Delay (s)	10.6	7.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	7.5	0.0
Approach LOS	B		

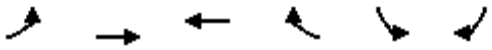
Intersection Summary				
Average Delay		4.5		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	11	0	9	3	2	3	11	208	7	60	302	39
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)	12	0	10	3	2	3	12	226	8	65	328	42
Pedestrians		85			165			17			83	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			14			1			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	906	988	451	925	1005	478	456			399		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	898	986	404	919	1005	478	409			399		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	98	98	99	99	99			93		
cM capacity (veh/h)	161	168	544	153	163	469	982			996		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	9	246	436
Volume Left	12	3	12	65
Volume Right	10	3	8	42
cSH	236	209	982	996
Volume to Capacity	0.09	0.04	0.01	0.07
Queue Length 95th (m)	2.3	1.0	0.3	1.6
Control Delay (s)	21.8	22.9	0.5	2.0
Lane LOS	C	C	A	A
Approach Delay (s)	21.8	22.9	0.5	2.0
Approach LOS	C	C		

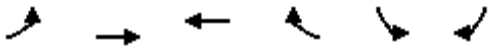
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	31	326	220	8	11	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	354	239	9	12	14
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		166				
pX, platoon unblocked						
vC, conflicting volume	279				756	387
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	279				756	387
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				96	98
cM capacity (veh/h)	1250				338	581

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	388	248	26
Volume Left	34	0	12
Volume Right	0	9	14
cSH	1250	1700	437
Volume to Capacity	0.03	0.15	0.06
Queue Length 95th (m)	0.6	0.0	1.4
Control Delay (s)	0.9	0.0	13.8
Lane LOS	A		B
Approach Delay (s)	0.9	0.0	13.8
Approach LOS			B

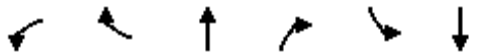
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	6	311	239	6	10	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	338	260	7	11	24
Pedestrians		100	100		50	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		9	9		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	316				764	413
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	316				764	413
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	96
cM capacity (veh/h)	1191				324	559

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	345	266	35
Volume Left	7	0	11
Volume Right	0	7	24
cSH	1191	1700	456
Volume to Capacity	0.01	0.16	0.08
Queue Length 95th (m)	0.1	0.0	1.9
Control Delay (s)	0.2	0.0	13.6
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	13.6
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	3	10	39	8	18	181
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	42	9	20	197
Pedestrians	20		32			18
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		3			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	335	85			71	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	335	85			71	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	623	943			1503	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	51	216
Volume Left	3	0	20
Volume Right	11	9	0
cSH	843	1700	1503
Volume to Capacity	0.02	0.03	0.01
Queue Length 95th (m)	0.4	0.0	0.3
Control Delay (s)	9.3	0.0	0.8
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	0.8
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

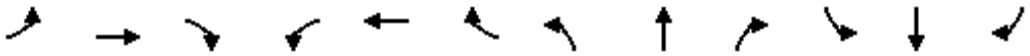
63: Queen St & Artillery Performance by approach

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.9	0.2	0.1	0.0	1.2
Delay / Veh (s)	8.8	5.8	9.9	6.2	8.2
Total Stops	63	9	27	13	112
Travel Dist (km)	42.8	9.7	4.1	1.4	57.9
Travel Time (hr)	2.2	0.4	0.2	0.1	2.9
Avg Speed (kph)	20	24	18	17	21
Vehicles Entered	384	97	39	19	539
Vehicles Exited	378	94	38	19	529
Hourly Exit Rate	378	94	38	19	529

177: Spring Garden Road & Brunswick Street Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.2	0.1	0.7	1.0
Delay / Veh (s)	1.9	1.4	15.5	4.8
Total Stops	50	20	151	221
Travel Dist (km)	15.4	18.3	7.6	41.4
Travel Time (hr)	0.6	0.6	1.0	2.2
Avg Speed (kph)	28	32	8	20
Vehicles Entered	332	262	170	764
Vehicles Exited	332	262	171	765
Hourly Exit Rate	332	262	171	765

Scenario B 2020 PM with background traffic growth



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.92		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	0.96	1.00			0.96		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1476	1547			1418		1594	1607		1412	1416	
Flt Permitted	0.45	1.00			0.90		0.15	1.00		0.30	1.00	
Satd. Flow (perm)	705	1547			1292		258	1607		450	1416	
Volume (vph)	446	284	32	16	109	76	53	319	31	85	170	410
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	474	326	44	36	122	85	68	389	44	99	189	519
RTOR Reduction (vph)	0	7	0	0	27	0	0	6	0	0	137	0
Lane Group Flow (vph)	474	363	0	0	216	0	68	427	0	99	571	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			20.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	38.0	38.0			22.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.53	0.53			0.31		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	501	816			395		93	580		163	511	
v/s Ratio Prot	c0.16	0.23						0.27			c0.40	
v/s Ratio Perm	c0.34				0.17		0.26			0.22		
v/c Ratio	0.95	0.45			0.55		0.73	0.74		0.61	1.12	
Uniform Delay, d1	15.5	10.5			20.8		20.0	20.0		18.8	23.0	
Progression Factor	1.00	1.00			1.23		1.00	1.00		0.89	0.75	
Incremental Delay, d2	28.8	1.8			5.3		39.6	8.1		14.3	74.1	
Delay (s)	44.3	12.3			31.0		59.6	28.1		31.1	91.3	
Level of Service	D	B			C		E	C		C	F	
Approach Delay (s)		30.3			31.0			32.4			83.9	
Approach LOS		C			C			C			F	

Intersection Summary			
HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	4%	
Volume (veh/h)	604	99	96	508	152	209
Peak Hour Factor	0.87	0.92	0.87	0.87	0.92	0.93
Hourly flow rate (vph)	694	108	110	584	165	225
Pedestrians	9			3	75	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			0	6	
Right turn flare (veh)						7
Median type					None	
Median storage veh)						
Upstream signal (m)	192			195		
pX, platoon unblocked			1.00		1.00	1.00
vC, conflicting volume			877		1345	826
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			877		1345	826
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		0	23
cM capacity (veh/h)			727		113	292

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	802	305	389	390
Volume Left	0	110	0	165
Volume Right	108	0	0	225
cSH	1700	727	1700	215
Volume to Capacity	0.47	0.15	0.23	1.82
Queue Length 95th (m)	0.0	4.0	0.0	207.3
Control Delay (s)	0.0	5.1	0.0	423.5
Lane LOS		A		F
Approach Delay (s)	0.0	2.2		423.5
Approach LOS				F

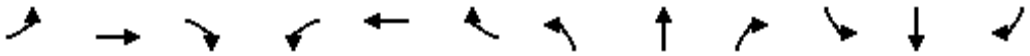
Intersection Summary			
Average Delay	88.4		
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	474	56	64	515	136	86
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	539	77	108	599	155	108
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			229		
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			650		1131	615
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			617		1144	578
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		0	73
cM capacity (veh/h)			849		148	405

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	615	308	399	262
Volume Left	0	108	0	155
Volume Right	77	0	0	108
cSH	1700	849	1700	200
Volume to Capacity	0.36	0.13	0.23	1.31
Queue Length 95th (m)	0.0	3.3	0.0	110.1
Control Delay (s)	0.0	4.4	0.0	215.9
Lane LOS		A		F
Approach Delay (s)	0.0	1.9		215.9
Approach LOS				F

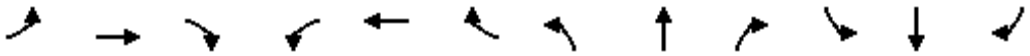
Intersection Summary			
Average Delay	36.6		
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	162	53	45	316	153	80	216	48	59	132	55
Peak Hour Factor	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Hourly flow rate (vph)	93	213	67	69	329	184	114	254	53	88	157	65

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	373	398	184	422	310
Volume Left (vph)	93	69	0	114	88
Volume Right (vph)	67	0	184	53	65
Hadj (s)	-0.02	0.12	-0.67	0.01	-0.03
Departure Headway (s)	9.1	9.3	8.5	8.9	9.3
Degree Utilization, x	0.94	1.03	0.43	1.05	0.80
Capacity (veh/h)	373	376	419	408	377
Control Delay (s)	62.6	82.7	16.6	87.8	41.2
Approach Delay (s)	62.6	61.8		87.8	41.2
Approach LOS	F	F		F	E

Intersection Summary				
Delay	64.7			
HCM Level of Service	F			
Intersection Capacity Utilization	71.8%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1728	1498		1858	1354	1668	1798	
Flt Permitted		0.97			0.74	1.00		0.97	1.00	0.19	1.00	
Satd. Flow (perm)		1918			1295	1498		1813	1354	332	1798	
Volume (vph)	12	175	50	96	214	391	30	541	169	246	250	16
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	188	54	97	216	395	31	564	176	251	255	16
RTOR Reduction (vph)	0	12	0	0	0	240	0	0	99	0	3	0
Lane Group Flow (vph)	0	243	0	0	313	155	0	595	77	251	268	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		21.0			21.0	21.0		32.0	32.0	45.0	45.0	
Effective Green, g (s)		24.0			24.0	24.0		35.0	35.0	48.0	48.0	
Actuated g/C Ratio		0.30			0.30	0.30		0.44	0.44	0.60	0.60	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		575			389	449		793	592	350	1079	
v/s Ratio Prot										c0.08	0.15	
v/s Ratio Perm		0.13			c0.24	0.10		0.33	0.06	c0.35		
v/c Ratio		0.42			0.80	0.34		0.75	0.13	0.72	0.25	
Uniform Delay, d1		22.4			25.8	21.9		18.8	13.4	12.1	7.5	
Progression Factor		1.00			1.00	1.00		0.71	0.98	1.00	1.00	
Incremental Delay, d2		2.3			16.1	2.1		4.6	0.3	11.9	0.6	
Delay (s)		24.7			41.9	24.0		18.0	13.5	24.0	8.1	
Level of Service		C			D	C		B	B	C	A	
Approach Delay (s)		24.7			31.9			16.9			15.7	
Approach LOS		C			C			B			B	

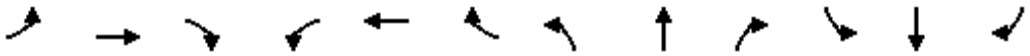
Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.95			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Satd. Flow (prot)	1690	1694		1668	1892	1316		3145			3408	1386
Flt Permitted	0.36	1.00		0.34	1.00	1.00		0.78			0.62	1.00
Satd. Flow (perm)	633	1694		599	1892	1316		2474			2132	1386
Volume (vph)	83	228	97	84	398	75	124	478	106	62	207	46
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	108	281	143	99	410	95	170	525	143	103	233	54
RTOR Reduction (vph)	0	23	0	0	0	45	0	22	0	0	0	27
Lane Group Flow (vph)	108	401	0	99	410	50	0	817	0	0	336	27
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	253	678		240	757	526		1237			1066	693
v/s Ratio Prot		c0.24			0.22							
v/s Ratio Perm	0.17			0.17		0.04		c0.33			0.16	0.02
v/c Ratio	0.43	0.59		0.41	0.54	0.10		0.66			0.32	0.04
Uniform Delay, d1	17.4	18.9		17.2	18.4	15.0		14.9			11.9	10.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.87			0.89	0.85
Incremental Delay, d2	5.2	3.8		5.2	2.8	0.4		2.3			0.8	0.1
Delay (s)	22.5	22.7		22.4	21.2	15.3		15.4			11.3	8.8
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		22.7			20.4			15.4			10.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

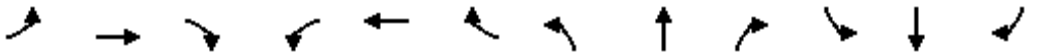
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	0	0	7	80	55	10	52	8	25	58	56
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	8	87	60	11	57	9	27	63	61
Pedestrians		45			51			36			74	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	453	331	174	317	357	186	169			116		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	453	331	174	317	357	186	169			116		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	84	92	99			98		
cM capacity (veh/h)	370	548	842	558	530	767	1409			1408		

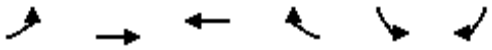
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	154	76	151
Volume Left	8	11	27
Volume Right	60	9	61
cSH	603	1409	1408
Volume to Capacity	0.26	0.01	0.02
Queue Length 95th (m)	7.7	0.2	0.4
Control Delay (s)	13.0	1.1	1.5
Lane LOS	B	A	A
Approach Delay (s)	13.0	1.1	1.5
Approach LOS	B		

Intersection Summary				
Average Delay	6.1			
Intersection Capacity Utilization	32.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.89		1.00	1.00	0.56
Flpb, ped/bikes	0.81	1.00	1.00		0.95	1.00	0.77	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1317	1448	354		1522	684	1343	1586		1723	1739	855
Flt Permitted	0.40	1.00	1.00		0.94	1.00	0.53	1.00		0.24	1.00	1.00
Satd. Flow (perm)	548	1448	354		1434	684	744	1586		435	1739	855
Volume (vph)	71	224	53	31	225	111	90	551	82	80	279	67
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	76	252	63	40	300	131	108	580	102	103	310	81
RTOR Reduction (vph)	0	0	41	0	0	20	0	6	0	0	0	0
Lane Group Flow (vph)	76	252	22	0	340	111	108	676	0	103	310	81
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	25.0	25.0	25.0		25.0	25.0	41.0	41.0		41.0	41.0	41.0
Effective Green, g (s)	28.0	28.0	28.0		28.0	28.0	44.0	44.0		44.0	44.0	44.0
Actuated g/C Ratio	0.35	0.35	0.35		0.35	0.35	0.55	0.55		0.55	0.55	0.55
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	192	507	124		502	239	409	872		239	956	470
v/s Ratio Prot		0.17						c0.43			0.18	
v/s Ratio Perm	0.14		0.06		c0.24	0.16	0.15			0.24		0.09
v/c Ratio	0.40	0.50	0.18		0.68	0.46	0.26	0.77		0.43	0.32	0.17
Uniform Delay, d1	19.6	20.5	18.0		22.2	20.2	9.5	14.1		10.6	9.9	8.9
Progression Factor	1.02	0.96	1.33		0.75	0.69	1.13	1.22		0.76	0.76	0.74
Incremental Delay, d2	5.3	3.1	2.7		6.8	6.0	1.5	6.3		5.4	0.9	0.8
Delay (s)	25.3	22.7	26.7		23.5	19.9	12.2	23.6		13.4	8.3	7.4
Level of Service	C	C	C		C	B	B	C		B	A	A
Approach Delay (s)		23.8			22.5			22.0			9.2	
Approach LOS		C			C			C			A	

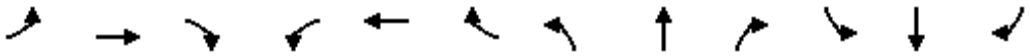
Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	13	274	472	8	26	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	298	513	9	28	40
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	606				930	601
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	606				930	601
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				90	91
cM capacity (veh/h)	902				270	464

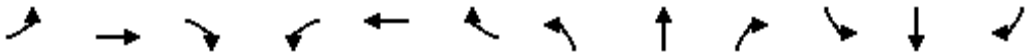
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	312	522	68
Volume Left	14	0	28
Volume Right	0	9	40
cSH	902	1700	358
Volume to Capacity	0.02	0.31	0.19
Queue Length 95th (m)	0.4	0.0	5.3
Control Delay (s)	0.6	0.0	17.4
Lane LOS	A		C
Approach Delay (s)	0.6	0.0	17.4
Approach LOS			C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.86			0.91			0.85			0.73	
Flpb, ped/bikes		1.00			1.00			0.93			0.94	
Frt		0.98			0.99			0.97			0.94	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		1269			1453			1551			1370	
Flt Permitted		1.00			1.00			0.90			0.95	
Satd. Flow (perm)		1269			1453			1415			1306	
Volume (vph)	0	279	36	0	295	25	28	82	19	12	64	73
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	0	310	58	0	335	36	36	85	36	31	94	91
RTOR Reduction (vph)	0	8	0	0	5	0	0	12	0	0	6	0
Lane Group Flow (vph)	0	360	0	0	366	0	0	145	0	0	210	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		39.0			39.0			29.0			29.0	
Effective Green, g (s)		41.0			41.0			31.0			31.0	
Actuated g/C Ratio		0.51			0.51			0.39			0.39	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		650			745			548			506	
v/s Ratio Prot		c0.28			0.25							
v/s Ratio Perm								0.10			c0.16	
v/c Ratio		0.55			0.49			0.26			0.42	
Uniform Delay, d1		13.3			12.7			16.7			17.9	
Progression Factor		1.06			0.75			0.99			0.98	
Incremental Delay, d2		2.9			2.2			1.2			2.5	
Delay (s)		17.0			11.7			17.7			20.0	
Level of Service		B			B			B			B	
Approach Delay (s)		17.0			11.7			17.7			20.0	
Approach LOS		B			B			B			B	

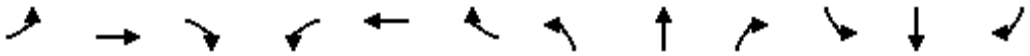
Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			1%			2%			-4%	
Volume (veh/h)	15	317	15	19	295	24	9	21	47	2	8	28
Peak Hour Factor	0.81	0.91	0.68	0.71	0.84	0.76	0.75	0.95	0.75	0.50	0.74	0.78
Hourly flow rate (vph)	19	348	22	27	351	32	12	22	63	4	11	36
Pedestrians		122			22			297			436	
Lane Width (m)		3.0			3.0			3.9			4.8	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			27			48	
Right turn flare (veh)									4			
Median type								None			None	
Median storage veh)												
Upstream signal (m)		80			81							
pX, platoon unblocked	0.89			0.89			0.94	0.94	0.89	0.94	0.94	0.89
vC, conflicting volume	819			667			1277	1566	678	1317	1561	925
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	796			625			1116	1422	637	1159	1417	916
tC, single (s)	4.2			4.1			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	95			96			63	50	80	80	76	74
cM capacity (veh/h)	368			627			33	44	307	20	45	140

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	389	410	97	51
Volume Left	19	27	12	4
Volume Right	22	32	63	36
cSH	368	627	114	72
Volume to Capacity	0.05	0.04	0.85	0.70
Queue Length 95th (m)	1.2	1.0	38.2	24.4
Control Delay (s)	1.7	1.3	100.1	129.8
Lane LOS	A	A	F	F
Approach Delay (s)	1.7	1.3	100.1	129.8
Approach LOS			F	F

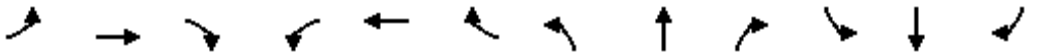
Intersection Summary			
Average Delay	18.4		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	11	25	6	8	104	13	10	21	11	15	19	26
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)	12	27	7	9	113	14	11	23	12	16	21	28
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	332	258	158	245	266	156	124			94		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	332	258	158	245	266	156	124			94		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	95	99	98	80	98	99			99		
cM capacity (veh/h)	411	563	796	556	557	796	1369			1425		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	46	136	46	65
Volume Left	12	9	11	16
Volume Right	7	14	12	28
cSH	534	575	1369	1425
Volume to Capacity	0.09	0.24	0.01	0.01
Queue Length 95th (m)	2.1	6.9	0.2	0.3
Control Delay (s)	12.4	13.2	1.9	2.0
Lane LOS	B	B	A	A
Approach Delay (s)	12.4	13.2	1.9	2.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	8.8			
Intersection Capacity Utilization	32.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.89		1.00	1.00		1.00	0.83			1.00	
Flpb, ped/bikes	1.00	1.00		0.66	1.00		0.61	1.00			1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.94			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1807	1307		1113	1576		997	1471			1838	
Flt Permitted	0.47	1.00		0.48	1.00		0.63	1.00			0.98	
Satd. Flow (perm)	890	1307		564	1576		661	1471			1807	
Volume (vph)	55	270	36	105	277	26	103	267	176	6	130	27
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	60	287	49	150	322	28	143	290	189	7	141	29
RTOR Reduction (vph)	0	8	0	0	4	0	0	25	0	0	9	0
Lane Group Flow (vph)	60	328	0	150	346	0	143	454	0	0	168	0
Confl. Peds. (#/hr)			420	420			271		340			
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	37.0		37.0	37.0		31.0	31.0			31.0	
Effective Green, g (s)	39.0	39.0		39.0	39.0		33.0	33.0			33.0	
Actuated g/C Ratio	0.49	0.49		0.49	0.49		0.41	0.41			0.41	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	434	637		275	768		273	607			745	
v/s Ratio Prot		0.25			0.22			c0.31				
v/s Ratio Perm	0.07			c0.27			0.22				0.09	
v/c Ratio	0.14	0.52		0.55	0.45		0.52	0.75			0.23	
Uniform Delay, d1	11.3	14.0		14.3	13.5		17.6	20.0			15.2	
Progression Factor	0.91	0.75		1.00	1.00		1.00	1.00			1.03	
Incremental Delay, d2	0.6	2.7		7.6	1.9		7.0	8.2			0.7	
Delay (s)	10.9	13.2		21.9	15.4		24.6	28.2			16.3	
Level of Service	B	B		C	B		C	C			B	
Approach Delay (s)		12.9			17.3			27.3			16.3	
Approach LOS		B			B			C			B	

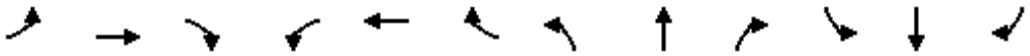
Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	366	77	37	334	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	398	84	40	363	0	0
Pedestrians	591				630	
Lane Width (m)	3.0				0.0	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	41				0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.89		0.94	0.89
vC, conflicting volume			1112		2104	1070
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1125		2001	1078
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	100
cM capacity (veh/h)			552		34	236

Direction, Lane #	EB 1	WB 1
Volume Total	482	403
Volume Left	0	40
Volume Right	84	0
cSH	1700	552
Volume to Capacity	0.28	0.07
Queue Length 95th (m)	0.0	1.8
Control Delay (s)	0.0	2.2
Lane LOS		A
Approach Delay (s)	0.0	2.2
Approach LOS		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	11	131	0	48	0	0	0	31	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	12	142	0	52	0	0	0	34	80
Pedestrians		28			32			60			84	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	361	238	162	270	278	116	142			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	361	238	162	270	278	116	142			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	76	100	96			100		
cM capacity (veh/h)	428	621	838	599	590	845	1441			1537		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	154	52	114
Volume Left	12	52	0
Volume Right	0	0	80
cSH	591	1441	1700
Volume to Capacity	0.26	0.04	0.07
Queue Length 95th (m)	7.9	0.9	0.0
Control Delay (s)	13.2	7.6	0.0
Lane LOS	B	A	
Approach Delay (s)	13.2	7.6	0.0
Approach LOS	B		

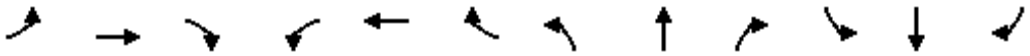
Intersection Summary				
Average Delay	7.6			
Intersection Capacity Utilization	31.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	29	265	530	0	0	276
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	288	576	0	0	300
Pedestrians	52		163			169
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.85	0.84			0.84	
vC, conflicting volume	1091	797			628	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1076	759			558	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	0			100	
cM capacity (veh/h)	170	279			814	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	32	288	576	300
Volume Left	32	0	0	0
Volume Right	0	288	0	0
cSH	170	279	1700	1700
Volume to Capacity	0.19	1.03	0.34	0.18
Queue Length 95th (m)	5.0	83.2	0.0	0.0
Control Delay (s)	31.0	102.4	0.0	0.0
Lane LOS	D	F		
Approach Delay (s)	95.4		0.0	0.0
Approach LOS	F			

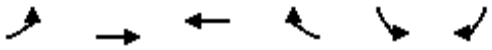
Intersection Summary			
Average Delay	25.5		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	27	4	17	2	22	48	38	424	1	2	181	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	4	18	2	24	52	41	461	1	2	197	91
Pedestrians		94			157			19			78	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			13			2			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	1027	1042	355	987	1087	696	382			619		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1027	1042	355	987	1087	696	382			619		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	74	98	97	99	85	85	96			100		
cM capacity (veh/h)	114	175	623	150	165	357	1082			832		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	52	78	503	290
Volume Left	29	2	41	2
Volume Right	18	52	1	91
cSH	167	256	1082	832
Volume to Capacity	0.31	0.31	0.04	0.00
Queue Length 95th (m)	9.5	9.5	0.9	0.1
Control Delay (s)	36.1	25.2	1.1	0.1
Lane LOS	E	D	A	A
Approach Delay (s)	36.1	25.2	1.1	0.1
Approach LOS	E	D		

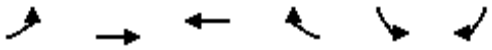
Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	45	280	442	7	20	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	304	480	8	22	32
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		168				
pX, platoon unblocked						
vC, conflicting volume	519				977	628
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	519				977	628
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				91	93
cM capacity (veh/h)	1019				244	424

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	353	488	53
Volume Left	49	0	22
Volume Right	0	8	32
cSH	1019	1700	326
Volume to Capacity	0.05	0.29	0.16
Queue Length 95th (m)	1.1	0.0	4.4
Control Delay (s)	1.6	0.0	18.2
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	18.2
Approach LOS			C

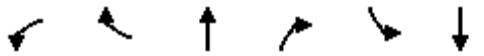
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	29	239	461	11	6	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	260	501	12	7	37
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	562				978	689
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	562				978	689
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				97	90
cM capacity (veh/h)	967				236	378

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	291	513	43
Volume Left	32	0	7
Volume Right	0	12	37
cSH	967	1700	347
Volume to Capacity	0.03	0.30	0.13
Queue Length 95th (m)	0.8	0.0	3.2
Control Delay (s)	1.3	0.0	16.9
Lane LOS	A		C
Approach Delay (s)	1.3	0.0	16.9
Approach LOS			C

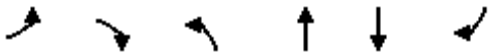
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	27	24	104	29	38	193
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	26	113	32	41	210
Pedestrians	102		74			46
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	9		6			4
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	597	277			247	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	597	277			247	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			97	
cM capacity (veh/h)	384	668			1204	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	55	145	251
Volume Left	29	0	41
Volume Right	26	32	0
cSH	480	1700	1204
Volume to Capacity	0.12	0.09	0.03
Queue Length 95th (m)	3.0	0.0	0.8
Control Delay (s)	13.5	0.0	1.6
Lane LOS	B		A
Approach Delay (s)	13.5	0.0	1.6
Approach LOS	B		

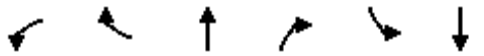
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	85	18	4	267	127	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	20	4	290	138	63
Pedestrians	95			14	26	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	8			1	2	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	589	279	296			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	589	279	296			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	97	100			
cM capacity (veh/h)	421	690	1162			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	112	295	201
Volume Left	92	4	0
Volume Right	20	0	63
cSH	452	1162	1700
Volume to Capacity	0.25	0.00	0.12
Queue Length 95th (m)	7.3	0.1	0.0
Control Delay (s)	15.6	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	15.6	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	29	27	246	84	37	133
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	29	267	91	40	145
Pedestrians	75		75			81
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		6			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			59			
pX, platoon unblocked						
vC, conflicting volume	688	469			434	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	688	469			434	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	94			96	
cM capacity (veh/h)	347	517			1054	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	61	359	185
Volume Left	32	0	40
Volume Right	29	91	0
cSH	413	1700	1054
Volume to Capacity	0.15	0.21	0.04
Queue Length 95th (m)	3.9	0.0	0.9
Control Delay (s)	15.2	0.0	2.1
Lane LOS	C		A
Approach Delay (s)	15.2	0.0	2.1
Approach LOS	C		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

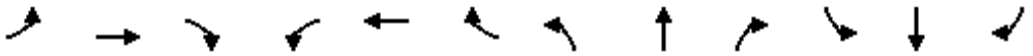
174: Queen Street & Birmingham Street Performance by approach

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.2	0.2	0.5	0.1	1.0
Delay / Veh (s)	1.5	1.5	10.8	3.7	3.1
Total Stops	63	22	172	54	311
Travel Dist (km)	43.4	39.3	15.8	7.2	105.8
Travel Time (hr)	1.5	1.1	1.0	0.4	3.9
Avg Speed (kph)	31	37	16	18	27
Vehicles Entered	438	387	171	110	1106
Vehicles Exited	437	385	171	109	1102
Hourly Exit Rate	291	257	114	73	735

177: Spring Garden Road & Brunswick Street Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.6	0.6	1.7	2.9
Delay / Veh (s)	3.3	3.5	27.6	6.9
Total Stops	141	132	192	465
Travel Dist (km)	30.3	49.0	11.8	91.1
Travel Time (hr)	1.3	2.0	2.1	5.4
Avg Speed (kph)	23	26	6	17
Vehicles Entered	645	645	221	1511
Vehicles Exited	646	646	221	1513
Hourly Exit Rate	431	431	147	1009

Scenario C 2020 AM with background traffic growth



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.94		1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1456	1608			1514		1626	1624		1473	1494	
Flt Permitted	0.63	1.00			0.90		0.15	1.00		0.54	1.00	
Satd. Flow (perm)	969	1608			1378		263	1624		840	1494	
Volume (vph)	248	328	35	7	35	34	9	161	25	224	271	484
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	273	349	50	18	41	41	18	201	36	238	327	563
RTOR Reduction (vph)	0	7	0	0	28	0	0	9	0	0	86	0
Lane Group Flow (vph)	273	392	0	0	72	0	18	228	0	238	804	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			20.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	38.0	38.0			22.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.53	0.53			0.31		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	593	849			421		95	586		303	540	
v/s Ratio Prot	0.08	c0.24						0.14			c0.54	
v/s Ratio Perm	0.17				0.05		0.07			0.28		
v/c Ratio	0.46	0.46			0.17		0.19	0.39		0.79	1.49	
Uniform Delay, d1	10.2	10.6			18.3		15.8	17.1		20.5	23.0	
Progression Factor	1.00	1.00			1.47		1.01	1.02		1.11	1.04	
Incremental Delay, d2	2.6	1.8			0.9		4.4	1.9		14.3	227.2	
Delay (s)	12.7	12.4			27.9		20.3	19.4		37.1	251.1	
Level of Service	B	B			C		C	B		D	F	
Approach Delay (s)		12.5			27.9			19.4			206.0	
Approach LOS		B			C			B			F	

Intersection Summary			
HCM Average Control Delay	115.3	HCM Level of Service	F
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.94			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1675			3610	1789	1529
Flt Permitted	1.00			0.58	0.95	1.00
Satd. Flow (perm)	1675			2128	1789	1529
Volume (vph)	554	184	129	421	86	115
Peak-hour factor, PHF	0.91	0.82	0.87	0.82	0.85	0.88
Adj. Flow (vph)	609	224	148	513	101	131
RTOR Reduction (vph)	17	0	0	0	0	100
Lane Group Flow (vph)	816	0	0	661	101	31
Confl. Peds. (#/hr)		44	44		4	5
Confl. Bikes (#/hr)		31				2
Heavy Vehicles (%)	2%	1%	2%	2%	0%	0%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	50.0			50.0	16.0	16.0
Effective Green, g (s)	53.0			53.0	19.0	19.0
Actuated g/C Ratio	0.66			0.66	0.24	0.24
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1110			1410	425	363
v/s Ratio Prot	c0.49				c0.06	
v/s Ratio Perm				0.31		0.02
v/c Ratio	0.74			0.47	0.24	0.09
Uniform Delay, d1	8.9			6.6	24.6	23.7
Progression Factor	1.30			1.00	1.10	1.42
Incremental Delay, d2	3.7			1.1	1.3	0.5
Delay (s)	15.2			7.7	28.3	34.1
Level of Service	B			A	C	C
Approach Delay (s)	15.2			7.7	31.6	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

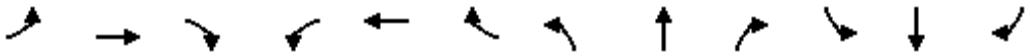
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	829	153	129	413	0	0
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	855	158	147	469	0	0
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.75		0.78	0.75
vC, conflicting volume			1047		1498	977
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1063		1440	969
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			70		100	100
cM capacity (veh/h)			487		67	188

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	1012	303	313
Volume Left	0	147	0
Volume Right	158	0	0
cSH	1700	487	1700
Volume to Capacity	0.60	0.30	0.18
Queue Length 95th (m)	0.0	9.5	0.0
Control Delay (s)	0.0	10.2	0.0
Lane LOS		B	
Approach Delay (s)	0.0	5.0	
Approach LOS			

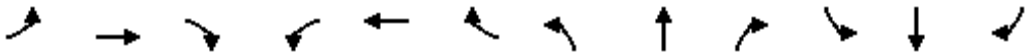
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	86	214	49	44	137	43	36	134	54	138	166	34
Peak Hour Factor	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Hourly flow rate (vph)	89	221	51	47	146	46	40	151	61	145	175	36

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	360	193	46	252	356
Volume Left (vph)	89	47	0	40	145
Volume Right (vph)	51	0	46	61	36
Hadj (s)	0.00	0.16	-0.67	-0.08	0.06
Departure Headway (s)	6.7	7.6	6.7	6.8	6.6
Degree Utilization, x	0.67	0.41	0.09	0.48	0.66
Capacity (veh/h)	499	419	466	472	500
Control Delay (s)	22.3	14.5	9.2	15.8	21.4
Approach Delay (s)	22.3	13.4		15.8	21.4
Approach LOS	C	B		C	C

Intersection Summary				
Delay	19.0			
HCM Level of Service	C			
Intersection Capacity Utilization	79.4%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1997			1712	1502		1859	1349	1636	1812	
Flt Permitted		0.98			0.65	1.00		0.97	1.00	0.36	1.00	
Satd. Flow (perm)		1962			1136	1502		1814	1349	612	1812	
Volume (vph)	11	206	39	109	161	132	12	243	115	463	339	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	224	42	115	169	139	13	270	128	503	368	7
RTOR Reduction (vph)	0	8	0	0	0	96	0	0	91	0	1	0
Lane Group Flow (vph)	0	270	0	0	284	43	0	283	37	503	374	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		20.0	20.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		23.0	23.0	47.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.29	0.29	0.59	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		613			355	469		522	388	616	1065	
v/s Ratio Prot										c0.20	0.21	
v/s Ratio Perm		0.14			c0.25	0.03		0.16	0.03	c0.28		
v/c Ratio		0.44			0.80	0.09		0.54	0.09	0.82	0.35	
Uniform Delay, d1		21.9			25.2	19.5		24.1	20.9	11.2	8.6	
Progression Factor		1.00			0.66	0.30		0.91	1.35	1.00	1.00	
Incremental Delay, d2		2.3			15.9	0.4		3.4	0.4	11.4	0.9	
Delay (s)		24.2			32.4	6.2		25.3	28.5	22.7	9.5	
Level of Service		C			C	A		C	C	C	A	
Approach Delay (s)		24.2			23.8			26.3			17.0	
Approach LOS		C			C			C			B	

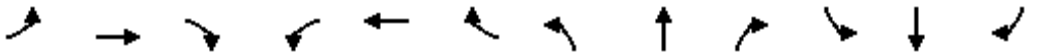
Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1589	1652		1677	1874	1369		3234			3480	1527
Flt Permitted	0.58	1.00		0.32	1.00	1.00		0.67			0.67	1.00
Satd. Flow (perm)	978	1652		562	1874	1369		2189			2345	1527
Volume (vph)	40	200	188	55	176	35	97	311	91	106	353	41
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	238	219	62	210	49	156	389	99	129	430	76
RTOR Reduction (vph)	0	41	0	0	0	29	0	18	0	0	0	39
Lane Group Flow (vph)	49	416	0	62	210	20	0	626	0	0	559	37
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	403	681		232	773	565		1067			1143	744
v/s Ratio Prot		c0.25			0.11							
v/s Ratio Perm	0.05			0.11		0.01		c0.29			0.24	0.02
v/c Ratio	0.12	0.61		0.27	0.27	0.04		0.59			0.49	0.05
Uniform Delay, d1	14.5	18.5		15.5	15.5	14.0		14.7			13.8	10.8
Progression Factor	0.97	0.92		1.00	1.00	1.00		0.65			0.83	0.60
Incremental Delay, d2	0.6	3.9		2.8	0.9	0.1		2.1			1.4	0.1
Delay (s)	14.6	20.8		18.3	16.4	14.1		11.7			12.9	6.5
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		20.2			16.4			11.7			12.1	
Approach LOS		C			B			B			B	

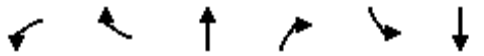
Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.91		1.00	1.00	0.68
Flpb, ped/bikes	0.75	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1197	1564	545		1308	802	1658	1615		1790	1773	1021
Flt Permitted	0.55	1.00	1.00		0.91	1.00	0.37	1.00		0.32	1.00	1.00
Satd. Flow (perm)	696	1564	545		1206	802	641	1615		609	1773	1021
Volume (vph)	80	193	93	35	170	67	43	395	56	62	403	49
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	131	230	112	41	189	81	59	454	81	93	480	53
RTOR Reduction (vph)	0	0	69	0	0	50	0	8	0	0	0	20
Lane Group Flow (vph)	131	230	43	0	230	31	59	527	0	93	480	33
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	28.0	28.0	28.0		28.0	28.0	38.0	38.0		38.0	38.0	38.0
Effective Green, g (s)	31.0	31.0	31.0		31.0	31.0	41.0	41.0		41.0	41.0	41.0
Actuated g/C Ratio	0.39	0.39	0.39		0.39	0.39	0.51	0.51		0.51	0.51	0.51
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	270	606	211		467	311	329	828		312	909	523
v/s Ratio Prot		0.15						c0.33			0.27	
v/s Ratio Perm	0.19		0.08		c0.19	0.04	0.09			0.15		0.03
v/c Ratio	0.49	0.38	0.21		0.49	0.10	0.18	0.64		0.30	0.53	0.06
Uniform Delay, d1	18.5	17.6	16.3		18.5	15.6	10.5	14.1		11.2	13.0	9.8
Progression Factor	1.00	1.00	1.00		0.69	0.30	1.08	1.25		0.76	0.80	0.60
Incremental Delay, d2	6.1	1.8	2.2		3.6	0.6	1.1	3.5		2.3	2.1	0.2
Delay (s)	24.6	19.4	18.5		16.5	5.4	12.5	21.1		10.8	12.5	6.2
Level of Service	C	B	B		B	A	B	C		B	B	A
Approach Delay (s)		20.6			13.6			20.2			11.7	
Approach LOS		C			B			C			B	

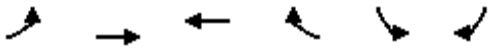
Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	16	64	421	0	10	484
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	70	458	0	11	526
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.91	0.88			0.88	
vC, conflicting volume	1211	615			530	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1028	560			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	83			99	
cM capacity (veh/h)	193	402			903	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	87	458	537
Volume Left	17	0	11
Volume Right	70	0	0
cSH	331	1700	903
Volume to Capacity	0.26	0.27	0.01
Queue Length 95th (m)	7.9	0.0	0.3
Control Delay (s)	19.7	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	19.7	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		



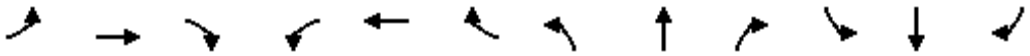
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	8	342	236	4	20	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	372	257	4	22	11
Pedestrians		1	3		80	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	341				731	340
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	341				731	340
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	1135				359	654

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	380	261	33
Volume Left	9	0	22
Volume Right	0	4	11
cSH	1135	1700	422
Volume to Capacity	0.01	0.15	0.08
Queue Length 95th (m)	0.2	0.0	1.9
Control Delay (s)	0.3	0.0	14.2
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	14.2
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						1.00	
Frpb, ped/bikes		0.91		1.00	1.00						0.79	
Flpb, ped/bikes		1.00		0.73	1.00						0.93	
Frt		0.98		1.00	1.00						0.95	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1424		1234	1364						1495	
Flt Permitted		1.00		0.48	1.00						0.99	
Satd. Flow (perm)		1424		626	1364						1495	
Volume (vph)	0	255	39	25	193	0	0	0	0	20	73	55
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	0	304	53	42	224	0	0	0	0	27	95	76
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	28	0
Lane Group Flow (vph)	0	349	0	42	224	0	0	0	0	0	170	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		41.0		41.0	41.0						27.0	
Effective Green, g (s)		43.0		43.0	43.0						29.0	
Actuated g/C Ratio		0.54		0.54	0.54						0.36	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Lane Grp Cap (vph)		765		336	733						542	
v/s Ratio Prot		c0.25			0.16							
v/s Ratio Perm				0.07							0.11	
v/c Ratio		0.46		0.12	0.31						0.31	
Uniform Delay, d1		11.3		9.2	10.2						18.3	
Progression Factor		0.76		0.83	0.85						0.81	
Incremental Delay, d2		1.8		0.7	1.0						1.4	
Delay (s)		10.4		8.3	9.7						16.3	
Level of Service		B		A	A						B	
Approach Delay (s)		10.4			9.5			0.0			16.3	
Approach LOS		B			A			A			B	

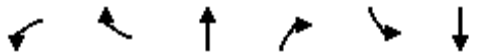
Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			1%			2%			-4%	
Volume (veh/h)	15	256	0	0	205	129	4	25	19	0	0	0
Peak Hour Factor	0.65	0.92	0.38	0.83	0.75	0.88	0.33	0.50	0.67	0.42	0.92	0.58
Hourly flow rate (vph)	23	278	0	0	273	147	12	50	28	0	0	0
Pedestrians		96			2			216			324	
Lane Width (m)		3.0			3.0			3.9			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			0			20			0	
Right turn flare (veh)									4			
Median type								None			None	
Median storage veh)												
Upstream signal (m)		81			80							
pX, platoon unblocked	0.94			0.98			0.95	0.95	0.98	0.95	0.95	0.94
vC, conflicting volume	744			494			983	1284	496	1036	1211	767
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	728			482			946	1262	484	1002	1185	752
tC, single (s)	4.1			4.2			7.1	6.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	97			100			92	61	93	100	100	100
cM capacity (veh/h)	833			830			145	128	423	116	142	364

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	23	278	420	90
Volume Left	23	0	0	12
Volume Right	0	0	147	28
cSH	833	1700	1700	191
Volume to Capacity	0.03	0.16	0.25	0.47
Queue Length 95th (m)	0.6	0.0	0.0	17.4
Control Delay (s)	9.4	0.0	0.0	42.2
Lane LOS	A			E
Approach Delay (s)	0.7		0.0	42.2
Approach LOS				E

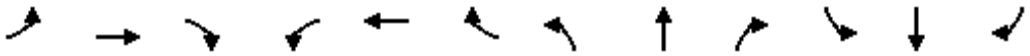
Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	46	17	102	0	0	386
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	18	111	0	0	420
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			61			237
pX, platoon unblocked						
vC, conflicting volume	575	157			132	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	575	157			132	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	98			100	
cM capacity (veh/h)	461	854			1427	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	111	420
Volume Left	50	0	0
Volume Right	18	0	0
cSH	526	1700	1700
Volume to Capacity	0.13	0.07	0.25
Queue Length 95th (m)	3.4	0.0	0.0
Control Delay (s)	12.9	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.9	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.91		1.00	0.98		1.00	0.79			0.88	
Flpb, ped/bikes		0.94		0.67	1.00		1.00	1.00			0.98	
Frt		0.98		1.00	0.99		1.00	0.90			0.96	
Flt Protected		0.99		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2553		1101	1400		1503	1350			1739	
Flt Permitted		0.88		0.52	1.00		0.33	1.00			0.89	
Satd. Flow (perm)		2261		605	1400		516	1350			1566	
Volume (vph)	32	215	45	127	225	7	40	85	130	35	237	115
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	53	269	58	161	250	9	48	96	171	64	269	144
RTOR Reduction (vph)	0	18	0	0	2	0	0	80	0	0	19	0
Lane Group Flow (vph)	0	362	0	161	257	0	48	187	0	0	458	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		43.0		43.0	43.0		25.0	25.0			25.0	
Effective Green, g (s)		45.0		45.0	45.0		27.0	27.0			27.0	
Actuated g/C Ratio		0.56		0.56	0.56		0.34	0.34			0.34	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1272		340	788		174	456			529	
v/s Ratio Prot					0.18			0.14				
v/s Ratio Perm		0.16		c0.27			0.09				c0.29	
v/c Ratio		0.28		0.47	0.33		0.28	0.41			0.87	
Uniform Delay, d1		9.1		10.4	9.4		19.4	20.4			24.8	
Progression Factor		0.78		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.5		4.7	1.1		3.9	2.7			15.4	
Delay (s)		7.7		15.1	10.5		23.3	23.1			40.3	
Level of Service		A		B	B		C	C			D	
Approach Delay (s)		7.7			12.3			23.1			40.3	
Approach LOS		A			B			C			D	

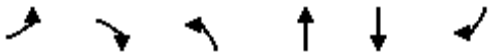
Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	308	46	19	218	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	335	50	21	237	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.92		0.94	0.92
vC, conflicting volume			385		938	360
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			330		879	303
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1129		231	677

Direction, Lane #	EB 1	WB 1
Volume Total	385	258
Volume Left	0	21
Volume Right	50	0
cSH	1700	1129
Volume to Capacity	0.23	0.02
Queue Length 95th (m)	0.0	0.4
Control Delay (s)	0.0	0.8
Lane LOS		A
Approach Delay (s)	0.0	0.8
Approach LOS		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	0	0	17	86	136	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	18	93	148	22
Pedestrians	24					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	313	183	194			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	313	183	194			
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	100	99			
cM capacity (veh/h)	670	860	1380			

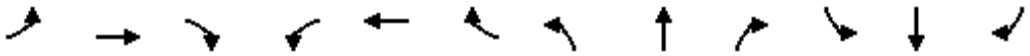
Direction, Lane #	NB 1	SB 1
Volume Total	112	170
Volume Left	18	0
Volume Right	0	22
cSH	1380	1700
Volume to Capacity	0.01	0.10
Queue Length 95th (m)	0.3	0.0
Control Delay (s)	1.4	0.0
Lane LOS	A	
Approach Delay (s)	1.4	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	7	0	1	20	0	12	0	11	18	54	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	0	1	22	0	13	0	12	20	59	28
Pedestrians		75			31			31			28	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	258	256	179	210	264	65	162			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	258	256	179	210	264	65	162			43		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	96	100	99			99		
cM capacity (veh/h)	565	577	787	642	571	949	1326			1524		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	23	25	107
Volume Left	0	1	13	20
Volume Right	0	0	12	28
cSH	577	574	1326	1524
Volume to Capacity	0.01	0.04	0.01	0.01
Queue Length 95th (m)	0.3	0.9	0.2	0.3
Control Delay (s)	11.3	11.5	4.1	1.4
Lane LOS	B	B	A	A
Approach Delay (s)	11.3	11.5	4.1	1.4
Approach LOS	B	B		

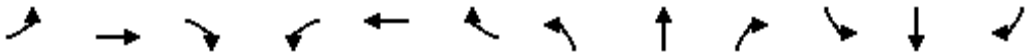
Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	28.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	16	11	4	2	19	31	6	21	1	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)	17	12	4	2	21	34	7	23	1	0	0	0
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	138	121	90	123	120	67	49			59		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	138	121	90	123	120	67	49			59		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	100	100	97	97	100			100		
cM capacity (veh/h)	709	712	895	739	712	966	1492			1499		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	34	57	30
Volume Left	17	2	7
Volume Right	4	34	1
cSH	730	846	1492
Volume to Capacity	0.05	0.07	0.00
Queue Length 95th (m)	1.1	1.6	0.1
Control Delay (s)	10.2	9.6	1.6
Lane LOS	B	A	A
Approach Delay (s)	10.2	9.6	1.6
Approach LOS	B	A	

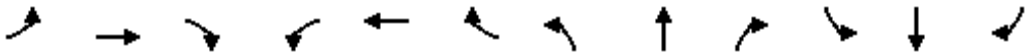
Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	30.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	7	0	2	47	0	4	0	0	0	41	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	0	2	51	0	4	0	0	0	45	26
Pedestrians		90			18			48			50	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	232	174	196	136	187	68	161			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232	174	196	136	187	68	161			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	92	100	100			100		
cM capacity (veh/h)	557	651	748	725	640	938	1309			1574		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	53	4	71
Volume Left	0	2	4	0
Volume Right	0	0	0	26
cSH	651	644	1309	1574
Volume to Capacity	0.01	0.08	0.00	0.00
Queue Length 95th (m)	0.3	2.0	0.1	0.0
Control Delay (s)	10.6	11.1	7.8	0.0
Lane LOS	B	B	A	
Approach Delay (s)	10.6	11.1	7.8	0.0
Approach LOS	B	B		

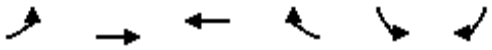
Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	31.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	11	0	6	3	2	3	11	234	7	60	308	32
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)	12	0	7	3	2	3	12	254	8	65	335	35
Pedestrians		85			165			17			83	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			14			1			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	937	1018	454	953	1032	506	455			427		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	937	1018	454	953	1032	506	455			427		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	99	98	99	99	99			93		
cM capacity (veh/h)	165	174	554	159	171	452	1026			972		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	9	274	435
Volume Left	12	3	12	65
Volume Right	7	3	8	35
cSH	219	215	1026	972
Volume to Capacity	0.08	0.04	0.01	0.07
Queue Length 95th (m)	2.1	1.0	0.3	1.6
Control Delay (s)	22.9	22.5	0.5	2.0
Lane LOS	C	C	A	A
Approach Delay (s)	22.9	22.5	0.5	2.0
Approach LOS	C	C		

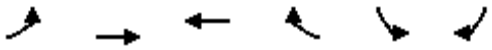
Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	25	358	208	8	11	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	389	226	9	12	27
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		166				
pX, platoon unblocked						
vC, conflicting volume	266				765	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				765	374
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	95
cM capacity (veh/h)	1264				336	591

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	416	235	39
Volume Left	27	0	12
Volume Right	0	9	27
cSH	1264	1700	479
Volume to Capacity	0.02	0.14	0.08
Queue Length 95th (m)	0.5	0.0	2.0
Control Delay (s)	0.7	0.0	13.2
Lane LOS	A		B
Approach Delay (s)	0.7	0.0	13.2
Approach LOS			B

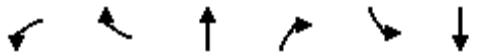
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	12	337	239	6	11	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	366	260	7	12	9
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	315				803	445
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315				803	445
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	98
cM capacity (veh/h)	1193				306	520

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	379	266	21
Volume Left	13	0	12
Volume Right	0	7	9
cSH	1193	1700	370
Volume to Capacity	0.01	0.16	0.06
Queue Length 95th (m)	0.3	0.0	1.3
Control Delay (s)	0.4	0.0	15.3
Lane LOS	A		C
Approach Delay (s)	0.4	0.0	15.3
Approach LOS			C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	0	0	0	0	34	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	37	201
Pedestrians	20					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	295	20			20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	295	20			20	
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	100			98	
cM capacity (veh/h)	680	1058			1596	

Direction, Lane #	SB 1
Volume Total	238
Volume Left	37
Volume Right	0
cSH	1596
Volume to Capacity	0.02
Queue Length 95th (m)	0.5
Control Delay (s)	1.3
Lane LOS	A
Approach Delay (s)	1.3
Approach LOS	

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	14.9%	ICU Level of Service	A
Analysis Period (min)	15		

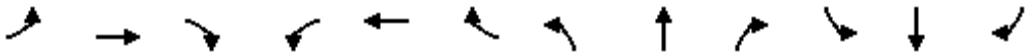
63: Queen St & Artillery Performance by approach

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.1	0.0	0.2	0.0	0.3
Delay / Veh (s)	0.8	0.3	3.6	4.0	1.7
Total Stops	1	0	71	16	88
Travel Dist (km)	30.3	10.2	14.4	2.5	57.4
Travel Time (hr)	0.9	0.3	0.6	0.1	1.9
Avg Speed (kph)	35	39	23	20	30
Vehicles Entered	264	106	163	34	567
Vehicles Exited	265	106	164	34	569
Hourly Exit Rate	265	106	164	34	569

177: Spring Garden Road & Brunswick Street Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.2	0.1	0.9	1.2
Delay / Veh (s)	2.3	1.7	17.8	5.6
Total Stops	67	25	158	250
Travel Dist (km)	15.6	19.9	8.5	44.0
Travel Time (hr)	0.6	0.6	1.2	2.5
Avg Speed (kph)	26	33	7	19
Vehicles Entered	335	286	182	803
Vehicles Exited	336	286	182	804
Hourly Exit Rate	336	286	182	804

Scenario C 2020 PM with background traffic growth



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.92		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	0.96	1.00			0.96		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1476	1547			1418		1594	1607		1412	1416	
Flt Permitted	0.45	1.00			0.90		0.15	1.00		0.30	1.00	
Satd. Flow (perm)	705	1547			1292		258	1607		450	1416	
Volume (vph)	446	284	32	16	109	76	53	319	31	85	170	410
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	474	326	44	36	122	85	68	389	44	99	189	519
RTOR Reduction (vph)	0	7	0	0	27	0	0	6	0	0	137	0
Lane Group Flow (vph)	474	363	0	0	216	0	68	427	0	99	571	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			20.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	38.0	38.0			22.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.53	0.53			0.31		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	501	816			395		93	580		163	511	
v/s Ratio Prot	c0.16	0.23						0.27			c0.40	
v/s Ratio Perm	c0.34				0.17		0.26			0.22		
v/c Ratio	0.95	0.45			0.55		0.73	0.74		0.61	1.12	
Uniform Delay, d1	15.5	10.5			20.8		20.0	20.0		18.8	23.0	
Progression Factor	1.00	1.00			1.23		1.00	1.00		0.89	0.75	
Incremental Delay, d2	28.8	1.8			5.3		39.6	8.1		14.3	74.1	
Delay (s)	44.3	12.3			31.0		59.6	28.1		31.0	91.3	
Level of Service	D	B			C		E	C		C	F	
Approach Delay (s)		30.3			31.0			32.4			83.9	
Approach LOS		C			C			C			F	

Intersection Summary			
HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.95			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1744			3637	1771	1488
Flt Permitted	1.00			0.63	0.95	1.00
Satd. Flow (perm)	1744			2295	1771	1488
Volume (vph)	625	99	73	532	225	348
Peak-hour factor, PHF	0.87	0.92	0.87	0.87	0.92	0.93
Adj. Flow (vph)	718	108	84	611	245	374
RTOR Reduction (vph)	7	0	0	0	0	86
Lane Group Flow (vph)	819	0	0	695	245	288
Confl. Peds. (#/hr)		75	75		9	3
Confl. Bikes (#/hr)		14				9
Heavy Vehicles (%)	1%	2%	0%	2%	1%	3%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	41.0			41.0	25.0	25.0
Effective Green, g (s)	44.0			44.0	28.0	28.0
Actuated g/C Ratio	0.55			0.55	0.35	0.35
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	959			1262	620	521
v/s Ratio Prot	c0.47				0.14	
v/s Ratio Perm				0.30		c0.19
v/c Ratio	0.85			0.55	0.40	0.55
Uniform Delay, d1	15.3			11.6	19.6	20.9
Progression Factor	0.87			1.00	1.28	1.41
Incremental Delay, d2	9.3			1.7	1.8	3.9
Delay (s)	22.6			13.4	26.8	33.5
Level of Service	C			B	C	C
Approach Delay (s)	22.6			13.4	30.9	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

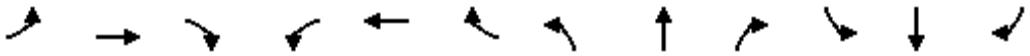
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	474	56	87	567	0	0
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	539	77	147	659	0	0
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.91		0.95	0.91
vC, conflicting volume			650		1240	615
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			617		1012	578
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		100	100
cM capacity (veh/h)			875		184	417

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	615	367	440
Volume Left	0	147	0
Volume Right	77	0	0
cSH	1700	875	1700
Volume to Capacity	0.36	0.17	0.26
Queue Length 95th (m)	0.0	4.6	0.0
Control Delay (s)	0.0	5.1	0.0
Lane LOS		A	
Approach Delay (s)	0.0	2.3	
Approach LOS			

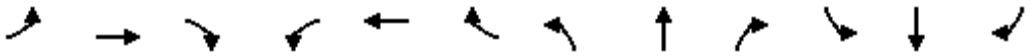
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	127	195	53	45	316	153	80	216	48	27	132	55
Peak Hour Factor	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Hourly flow rate (vph)	157	257	67	69	329	184	114	254	53	40	157	65

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	480	398	184	422	262
Volume Left (vph)	157	69	0	114	40
Volume Right (vph)	67	0	184	53	65
Hadj (s)	0.02	0.12	-0.67	0.01	-0.08
Departure Headway (s)	8.8	9.1	8.4	8.7	9.4
Degree Utilization, x	1.18	1.01	0.43	1.02	0.69
Capacity (veh/h)	401	398	427	422	374
Control Delay (s)	132.3	78.0	16.2	81.0	30.9
Approach Delay (s)	132.3	58.4		81.0	30.9
Approach LOS	F	F		F	D

Intersection Summary				
Delay	80.1			
HCM Level of Service	F			
Intersection Capacity Utilization	83.2%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1728	1498		1858	1354	1668	1798	
Flt Permitted		0.97			0.74	1.00		0.97	1.00	0.19	1.00	
Satd. Flow (perm)		1918			1295	1498		1813	1354	332	1798	
Volume (vph)	12	175	50	96	214	391	30	541	169	246	250	16
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	188	54	97	216	395	31	564	176	251	255	16
RTOR Reduction (vph)	0	12	0	0	0	240	0	0	99	0	3	0
Lane Group Flow (vph)	0	243	0	0	313	155	0	595	77	251	268	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		21.0			21.0	21.0		32.0	32.0	45.0	45.0	
Effective Green, g (s)		24.0			24.0	24.0		35.0	35.0	48.0	48.0	
Actuated g/C Ratio		0.30			0.30	0.30		0.44	0.44	0.60	0.60	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		575			389	449		793	592	350	1079	
v/s Ratio Prot										c0.08	0.15	
v/s Ratio Perm		0.13			c0.24	0.10		0.33	0.06	c0.35		
v/c Ratio		0.42			0.80	0.34		0.75	0.13	0.72	0.25	
Uniform Delay, d1		22.4			25.8	21.9		18.8	13.4	12.1	7.5	
Progression Factor		1.00			0.70	0.52		0.71	0.99	1.00	1.00	
Incremental Delay, d2		2.3			14.6	1.9		4.7	0.3	11.9	0.6	
Delay (s)		24.7			32.6	13.3		18.2	13.6	24.0	8.1	
Level of Service		C			C	B		B	B	C	A	
Approach Delay (s)		24.7			21.9			17.1			15.7	
Approach LOS		C			C			B			B	

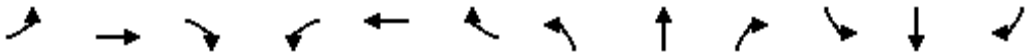
Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.95			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Satd. Flow (prot)	1690	1694		1668	1892	1316		3145			3408	1386
Flt Permitted	0.36	1.00		0.34	1.00	1.00		0.78			0.62	1.00
Satd. Flow (perm)	633	1694		599	1892	1316		2474			2132	1386
Volume (vph)	83	228	97	84	398	75	124	478	106	62	207	46
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	108	281	143	99	410	95	170	525	143	103	233	54
RTOR Reduction (vph)	0	23	0	0	0	45	0	22	0	0	0	27
Lane Group Flow (vph)	108	401	0	99	410	50	0	817	0	0	336	27
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	253	678		240	757	526		1237			1066	693
v/s Ratio Prot		c0.24			0.22							
v/s Ratio Perm	0.17			0.17		0.04		c0.33			0.16	0.02
v/c Ratio	0.43	0.59		0.41	0.54	0.10		0.66			0.32	0.04
Uniform Delay, d1	17.4	18.9		17.2	18.4	15.0		14.9			11.9	10.2
Progression Factor	1.01	1.01		1.00	1.00	1.00		0.87			0.87	0.84
Incremental Delay, d2	5.2	3.8		5.2	2.8	0.4		2.3			0.8	0.1
Delay (s)	22.6	22.8		22.4	21.2	15.3		15.4			11.1	8.7
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		22.7			20.4			15.4			10.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

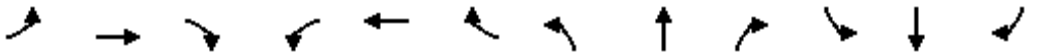
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	15	0	7	80	0	38	0	15	25	77	56
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	8	87	0	41	0	16	27	84	61
Pedestrians		45			51			36			74	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	422	363	195	354	386	133	190			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	422	363	195	354	386	133	190			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	100	98	82	100	97			98		
cM capacity (veh/h)	381	493	789	491	479	820	1331			1467		

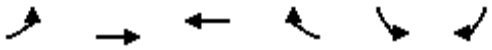
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	95	58	172
Volume Left	0	8	41	27
Volume Right	0	0	16	61
cSH	493	480	1331	1467
Volume to Capacity	0.03	0.20	0.03	0.02
Queue Length 95th (m)	0.8	5.5	0.7	0.4
Control Delay (s)	12.5	14.3	5.7	1.3
Lane LOS	B	B	A	A
Approach Delay (s)	12.5	14.3	5.7	1.3
Approach LOS	B	B		

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	32.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.89		1.00	1.00	0.56
Flpb, ped/bikes	0.78	1.00	1.00		0.95	1.00	0.78	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1257	1448	354		1512	684	1358	1586		1723	1739	855
Flt Permitted	0.43	1.00	1.00		0.93	1.00	0.52	1.00		0.25	1.00	1.00
Satd. Flow (perm)	572	1448	354		1414	684	739	1586		452	1739	855
Volume (vph)	71	224	53	31	197	111	118	551	82	65	293	67
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	76	252	63	40	263	131	142	580	102	83	326	81
RTOR Reduction (vph)	0	0	42	0	0	23	0	5	0	0	0	0
Lane Group Flow (vph)	76	252	21	0	303	108	142	677	0	83	326	81
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	24.0	24.0	24.0		24.0	24.0	42.0	42.0		42.0	42.0	42.0
Effective Green, g (s)	27.0	27.0	27.0		27.0	27.0	45.0	45.0		45.0	45.0	45.0
Actuated g/C Ratio	0.34	0.34	0.34		0.34	0.34	0.56	0.56		0.56	0.56	0.56
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	193	489	119		477	231	416	892		254	978	481
v/s Ratio Prot		0.17						c0.43			0.19	
v/s Ratio Perm	0.13		0.06		c0.21	0.16	0.19			0.18		0.09
v/c Ratio	0.39	0.52	0.18		0.64	0.47	0.34	0.76		0.33	0.33	0.17
Uniform Delay, d1	20.2	21.3	18.7		22.3	20.9	9.5	13.4		9.4	9.4	8.5
Progression Factor	1.02	1.01	1.38		0.72	0.64	1.18	1.25		0.75	0.76	0.74
Incremental Delay, d2	5.2	3.4	2.9		6.1	6.5	2.1	5.7		3.3	0.9	0.7
Delay (s)	25.8	24.9	28.6		22.2	19.9	13.3	22.4		10.3	8.1	7.0
Level of Service	C	C	C		C	B	B	C		B	A	A
Approach Delay (s)		25.7			21.5			20.8			8.3	
Approach LOS		C			C			C			A	

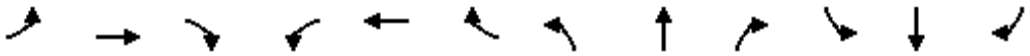
Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	13	274	472	8	26	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	298	513	9	28	40
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	606				930	601
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	606				930	601
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				90	91
cM capacity (veh/h)	902				270	464

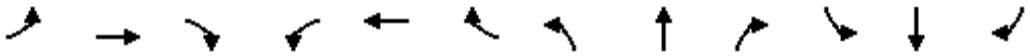
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	312	522	68
Volume Left	14	0	28
Volume Right	0	9	40
cSH	902	1700	358
Volume to Capacity	0.02	0.31	0.19
Queue Length 95th (m)	0.4	0.0	5.3
Control Delay (s)	0.6	0.0	17.4
Lane LOS	A		C
Approach Delay (s)	0.6	0.0	17.4
Approach LOS			C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						1.00	
Frpb, ped/bikes		0.85		1.00	1.00						0.73	
Flpb, ped/bikes		1.00		0.61	1.00						0.90	
Frt		0.98		1.00	1.00						0.94	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1259		965	1598						1321	
Flt Permitted		1.00		0.48	1.00						0.99	
Satd. Flow (perm)		1259		490	1598						1321	
Volume (vph)	0	264	36	39	295	0	0	0	0	12	64	73
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	0	293	58	70	335	0	0	0	0	31	94	91
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	342	0	70	335	0	0	0	0	0	210	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.0		40.0	40.0						28.0	
Effective Green, g (s)		42.0		42.0	42.0						30.0	
Actuated g/C Ratio		0.52		0.52	0.52						0.38	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Lane Grp Cap (vph)		661		257	839						495	
v/s Ratio Prot		c0.27			0.21							
v/s Ratio Perm				0.14							0.16	
v/c Ratio		0.52		0.27	0.40						0.42	
Uniform Delay, d1		12.4		10.5	11.4						18.6	
Progression Factor		0.99		0.78	0.82						0.91	
Incremental Delay, d2		2.5		2.2	1.2						2.6	
Delay (s)		14.8		10.4	10.5						19.5	
Level of Service		B		B	B						B	
Approach Delay (s)		14.8			10.5			0.0			19.5	
Approach LOS		B			B			A			B	

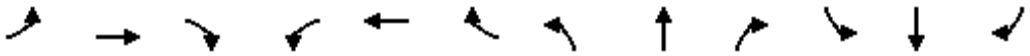
Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			1%			2%			-4%	
Volume (veh/h)	15	298	0	0	337	102	9	56	66	0	0	0
Peak Hour Factor	0.81	0.91	0.68	0.71	0.84	0.76	0.75	0.95	0.75	0.50	0.74	0.78
Hourly flow rate (vph)	19	327	0	0	401	134	12	59	88	0	0	0
Pedestrians		122			22			297			436	
Lane Width (m)		3.0			3.0			3.9			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			27			0	
Right turn flare (veh)									4			
Median type								None			None	
Median storage veh)												
Upstream signal (m)		80			81							
pX, platoon unblocked	0.85						0.85	0.85		0.85	0.85	0.85
vC, conflicting volume	971			624			1252	1633	646	1364	1566	1026
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	966			624			1296	1743	646	1428	1664	1031
tC, single (s)	4.2			4.1			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	97			100			79	0	74	0	100	100
cM capacity (veh/h)	590			707			59	53	342	0	59	223

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	19	327	535	159
Volume Left	19	0	0	12
Volume Right	0	0	134	88
cSH	590	1700	1700	110
Volume to Capacity	0.03	0.19	0.31	1.44
Queue Length 95th (m)	0.7	0.0	0.0	86.1
Control Delay (s)	11.3	0.0	0.0	312.1
Lane LOS	B			F
Approach Delay (s)	0.6		0.0	312.1
Approach LOS				F

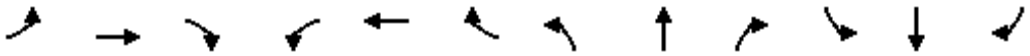
Intersection Summary			
Average Delay	47.9		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	33	25	6	8	75	48	10	36	11	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)	36	27	7	9	82	52	11	39	12	0	0	0
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	303	207	123	194	201	172	75			110		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303	207	123	194	201	172	75			110		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	96	99	99	87	94	99			100		
cM capacity (veh/h)	466	608	833	608	613	827	1426			1405		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	70	142	62
Volume Left	36	9	11
Volume Right	7	52	12
cSH	537	677	1426
Volume to Capacity	0.13	0.21	0.01
Queue Length 95th (m)	3.4	6.0	0.2
Control Delay (s)	12.7	11.7	1.4
Lane LOS	B	B	A
Approach Delay (s)	12.7	11.7	1.4
Approach LOS	B	B	

Intersection Summary				
Average Delay	9.6			
Intersection Capacity Utilization	35.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.90		1.00	0.94		1.00	0.77			0.76	
Flpb, ped/bikes		0.95		0.59	1.00		0.76	1.00			1.00	
Frt		0.98		1.00	0.99		1.00	0.92			0.95	
Flt Protected		0.99		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2448		987	1476		1244	1340			1353	
Flt Permitted		0.85		0.50	1.00		0.52	1.00			0.69	
Satd. Flow (perm)		2103		521	1476		679	1340			948	
Volume (vph)	55	268	36	85	277	26	112	225	260	45	128	100
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	60	285	49	121	322	28	156	245	280	49	139	109
RTOR Reduction (vph)	0	14	0	0	4	0	0	25	0	0	21	0
Lane Group Flow (vph)	0	380	0	121	346	0	156	500	0	0	276	0
Confl. Peds. (#/hr)	436		420	420		436	271		340	340		271
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		37.0		37.0	37.0		31.0	31.0			31.0	
Effective Green, g (s)		39.0		39.0	39.0		33.0	33.0			33.0	
Actuated g/C Ratio		0.49		0.49	0.49		0.41	0.41			0.41	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1025		254	720		280	553			391	
v/s Ratio Prot					c0.23			c0.37				
v/s Ratio Perm		0.18		0.23			0.23				0.29	
v/c Ratio		0.37		0.48	0.48		0.56	0.90			0.71	
Uniform Delay, d1		12.8		13.7	13.7		17.9	22.0			19.5	
Progression Factor		0.90		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.0		6.3	2.3		7.8	20.7			9.8	
Delay (s)		12.5		20.0	16.0		25.7	42.7			29.3	
Level of Service		B		B	B		C	D			C	
Approach Delay (s)		12.5			17.0			38.8			29.3	
Approach LOS		B			B			D			C	

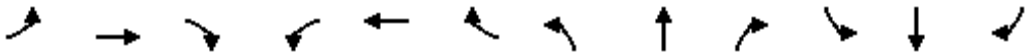
Intersection Summary				
HCM Average Control Delay	26.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	92.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	352	77	37	306	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	383	84	40	333	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.89		0.94	0.89
vC, conflicting volume			466		1138	424
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			398		987	350
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			1029		195	614

Direction, Lane #	EB 1	WB 1
Volume Total	466	373
Volume Left	0	40
Volume Right	84	0
cSH	1700	1029
Volume to Capacity	0.27	0.04
Queue Length 95th (m)	0.0	0.9
Control Delay (s)	0.0	1.3
Lane LOS		A
Approach Delay (s)	0.0	1.3
Approach LOS		

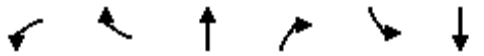
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	15	0	11	159	0	48	0	0	0	31	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	12	173	0	52	0	0	0	34	80
Pedestrians		28			32			60			84	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	377	238	162	278	278	116	142			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	377	238	162	278	278	116	142			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	100	98	70	100	96			100		
cM capacity (veh/h)	379	606	817	569	575	845	1406			1537		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	185	52	114
Volume Left	0	12	52	0
Volume Right	0	0	0	80
cSH	606	575	1406	1537
Volume to Capacity	0.03	0.32	0.04	0.00
Queue Length 95th (m)	0.6	10.5	0.9	0.0
Control Delay (s)	11.1	14.2	7.7	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.1	14.2	7.7	0.0
Approach LOS	B	B		

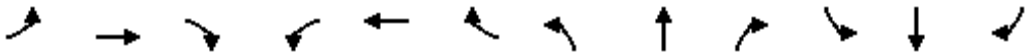
Intersection Summary				
Average Delay	8.7			
Intersection Capacity Utilization	34.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	39	293	530	0	16	276
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	318	576	0	17	300
Pedestrians	52		163			169
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.85	0.84			0.84	
vC, conflicting volume	1126	797			628	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1101	759			558	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	0			98	
cM capacity (veh/h)	161	279			814	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	361	576	317
Volume Left	42	0	17
Volume Right	318	0	0
cSH	257	1700	814
Volume to Capacity	1.40	0.34	0.02
Queue Length 95th (m)	150.4	0.0	0.5
Control Delay (s)	240.1	0.0	0.8
Lane LOS	F		A
Approach Delay (s)	240.1	0.0	0.8
Approach LOS	F		

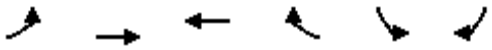
Intersection Summary			
Average Delay	69.3		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	27	4	2	2	22	48	38	476	1	2	164	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	4	2	2	24	52	41	517	1	2	178	98
Pedestrians		94			157			19			78	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			13			2			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	1068	1084	340	1012	1132	753	370			675		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1068	1084	340	1012	1132	753	370			675		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	97	100	99	85	84	96			100		
cM capacity (veh/h)	104	166	635	148	155	331	1093			793		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	78	560	278
Volume Left	29	2	41	2
Volume Right	2	52	1	98
cSH	115	240	1093	793
Volume to Capacity	0.31	0.33	0.04	0.00
Queue Length 95th (m)	9.2	10.4	0.9	0.1
Control Delay (s)	49.6	27.1	1.0	0.1
Lane LOS	E	D	A	A
Approach Delay (s)	49.6	27.1	1.0	0.1
Approach LOS	E	D		

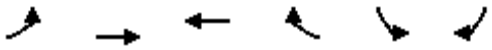
Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	33	343	423	7	20	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	373	460	8	22	52
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		168				
pX, platoon unblocked						
vC, conflicting volume	498				999	608
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	498				999	608
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				91	88
cM capacity (veh/h)	1037				241	436

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	467	74
Volume Left	36	0	22
Volume Right	0	8	52
cSH	1037	1700	352
Volume to Capacity	0.03	0.27	0.21
Queue Length 95th (m)	0.8	0.0	5.9
Control Delay (s)	1.1	0.0	17.9
Lane LOS	A		C
Approach Delay (s)	1.1	0.0	17.9
Approach LOS			C

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	43	290	431	11	38	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	315	468	12	41	16
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	529				1031	656
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	529				1031	656
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				81	96
cM capacity (veh/h)	994				216	395

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	362	480	58
Volume Left	47	0	41
Volume Right	0	12	16
cSH	994	1700	248
Volume to Capacity	0.05	0.28	0.23
Queue Length 95th (m)	1.1	0.0	6.7
Control Delay (s)	1.6	0.0	23.9
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	23.9
Approach LOS			C

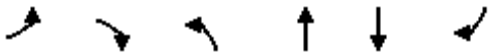
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	0	0	0	0	141	220
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	153	239
Pedestrians	102					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	648	102			102	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	648	102			102	
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	100			90	
cM capacity (veh/h)	390	953			1490	

Direction, Lane #	SB 1
Volume Total	392
Volume Left	153
Volume Right	0
cSH	1490
Volume to Capacity	0.10
Queue Length 95th (m)	2.6
Control Delay (s)	3.6
Lane LOS	A
Approach Delay (s)	3.6
Approach LOS	

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	0	0	41	351	127	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	45	382	138	63
Pedestrians	95					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	735	265	296			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	735	265	296			
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	100	96			
cM capacity (veh/h)	373	774	1265			

Direction, Lane #	NB 1	SB 1
Volume Total	426	201
Volume Left	45	0
Volume Right	0	63
cSH	1265	1700
Volume to Capacity	0.04	0.12
Queue Length 95th (m)	0.8	0.0
Control Delay (s)	1.2	0.0
Lane LOS	A	
Approach Delay (s)	1.2	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	29	27	289	0	0	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	29	314	0	0	275
Pedestrians			75			81
Lane Width (m)			3.7			3.7
Walking Speed (m/s)			1.2			1.2
Percent Blockage			6			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			58			237
pX, platoon unblocked						
vC, conflicting volume	664	395			314	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664	395			314	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	95			100	
cM capacity (veh/h)	398	609			1246	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	61	314	275
Volume Left	32	0	0
Volume Right	29	0	0
cSH	478	1700	1700
Volume to Capacity	0.13	0.18	0.16
Queue Length 95th (m)	3.3	0.0	0.0
Control Delay (s)	13.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.6	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

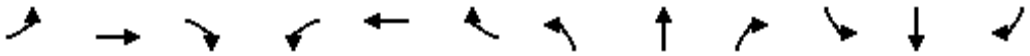
174: Queen Street & Birmingham Street Performance by approach

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.1	0.1	1.0	0.3	1.4
Delay / Veh (s)	0.9	0.9	18.9	8.0	6.0
Total Stops	0	0	184	84	268
Travel Dist (km)	24.9	27.8	20.9	8.8	82.3
Travel Time (hr)	0.8	0.7	1.6	0.6	3.7
Avg Speed (kph)	33	40	13	15	23
Vehicles Entered	242	279	187	125	833
Vehicles Exited	241	280	187	125	833
Hourly Exit Rate	241	280	187	125	833

177: Spring Garden Road & Brunswick Street Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.2	0.6	2.1	3.9
Delay / Veh (s)	8.1	4.6	63.2	12.6
Total Stops	206	112	117	435
Travel Dist (km)	24.5	36.2	6.6	67.3
Travel Time (hr)	1.8	1.6	2.4	5.8
Avg Speed (kph)	14	24	3	12
Vehicles Entered	525	481	122	1128
Vehicles Exited	524	481	122	1127
Hourly Exit Rate	524	481	122	1127

Scenario D 2020 AM with background traffic growth



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.94		1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1456	1608			1514		1626	1624		1473	1494	
Flt Permitted	0.63	1.00			0.90		0.15	1.00		0.54	1.00	
Satd. Flow (perm)	969	1608			1378		263	1624		840	1494	
Volume (vph)	248	328	35	7	35	34	9	161	25	224	271	484
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	273	349	50	18	41	41	18	201	36	238	327	563
RTOR Reduction (vph)	0	7	0	0	28	0	0	9	0	0	86	0
Lane Group Flow (vph)	273	392	0	0	72	0	18	228	0	238	804	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			20.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	38.0	38.0			22.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.53	0.53			0.31		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	593	849			421		95	586		303	540	
v/s Ratio Prot	0.08	c0.24						0.14			c0.54	
v/s Ratio Perm	0.17				0.05		0.07			0.28		
v/c Ratio	0.46	0.46			0.17		0.19	0.39		0.79	1.49	
Uniform Delay, d1	10.2	10.6			18.3		15.8	17.1		20.5	23.0	
Progression Factor	1.00	1.00			1.47		1.01	1.02		1.11	1.04	
Incremental Delay, d2	2.6	1.8			0.9		4.4	1.9		14.3	227.2	
Delay (s)	12.7	12.4			27.9		20.3	19.4		37.1	251.1	
Level of Service	B	B			C		C	B		D	F	
Approach Delay (s)		12.5			27.9			19.4			206.0	
Approach LOS		B			C			B			F	

Intersection Summary			
HCM Average Control Delay	115.3	HCM Level of Service	F
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.94			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1675			3610	1789	1529
Flt Permitted	1.00			0.58	0.95	1.00
Satd. Flow (perm)	1675			2128	1789	1529
Volume (vph)	554	184	129	421	86	115
Peak-hour factor, PHF	0.91	0.82	0.87	0.82	0.85	0.88
Adj. Flow (vph)	609	224	148	513	101	131
RTOR Reduction (vph)	17	0	0	0	0	100
Lane Group Flow (vph)	816	0	0	661	101	31
Confl. Peds. (#/hr)		44	44		4	5
Confl. Bikes (#/hr)		31				2
Heavy Vehicles (%)	2%	1%	2%	2%	0%	0%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	50.0			50.0	16.0	16.0
Effective Green, g (s)	53.0			53.0	19.0	19.0
Actuated g/C Ratio	0.66			0.66	0.24	0.24
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1110			1410	425	363
v/s Ratio Prot	c0.49				c0.06	
v/s Ratio Perm				0.31		0.02
v/c Ratio	0.74			0.47	0.24	0.09
Uniform Delay, d1	8.9			6.6	24.6	23.7
Progression Factor	1.17			1.00	1.10	1.44
Incremental Delay, d2	3.7			1.1	1.3	0.5
Delay (s)	14.1			7.7	28.4	34.6
Level of Service	B			A	C	C
Approach Delay (s)	14.1			7.7	31.9	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

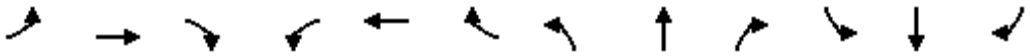
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	829	153	129	413	0	0
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	855	158	147	469	0	0
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.75		0.78	0.75
vC, conflicting volume			1047		1498	977
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1064		1442	968
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			70		100	100
cM capacity (veh/h)			485		66	187

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	1012	303	313
Volume Left	0	147	0
Volume Right	158	0	0
cSH	1700	485	1700
Volume to Capacity	0.60	0.30	0.18
Queue Length 95th (m)	0.0	9.6	0.0
Control Delay (s)	0.0	10.2	0.0
Lane LOS		B	
Approach Delay (s)	0.0	5.0	
Approach LOS			

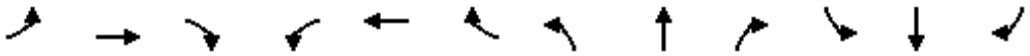
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	86	214	49	44	137	43	36	134	54	138	166	45
Peak Hour Factor	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Hourly flow rate (vph)	89	221	51	47	146	46	40	151	61	145	175	47

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	360	193	46	252	367
Volume Left (vph)	89	47	0	40	145
Volume Right (vph)	51	0	46	61	47
Hadj (s)	0.00	0.16	-0.67	-0.08	0.04
Departure Headway (s)	6.8	7.6	6.8	6.9	6.6
Degree Utilization, x	0.68	0.41	0.09	0.48	0.68
Capacity (veh/h)	496	415	461	467	502
Control Delay (s)	22.8	14.6	9.2	16.0	22.5
Approach Delay (s)	22.8	13.6		16.0	22.5
Approach LOS	C	B		C	C

Intersection Summary				
Delay	19.5			
HCM Level of Service	C			
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.96		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1998			1712	1545		1859	1351	1633	1812	
Flt Permitted		0.98			0.67	1.00		0.97	1.00	0.38	1.00	
Satd. Flow (perm)		1964			1165	1545		1816	1351	651	1812	
Volume (vph)	11	206	39	109	161	132	12	243	115	463	339	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	224	42	115	169	139	13	270	128	503	368	7
RTOR Reduction (vph)	0	8	0	0	0	94	0	0	88	0	1	0
Lane Group Flow (vph)	0	270	0	0	284	45	0	283	40	503	374	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		23.0			23.0	23.0		22.0	22.0	43.0	43.0	
Effective Green, g (s)		26.0			26.0	26.0		25.0	25.0	46.0	46.0	
Actuated g/C Ratio		0.32			0.32	0.32		0.31	0.31	0.58	0.58	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		638			379	502		568	422	583	1042	
v/s Ratio Prot										c0.18	0.21	
v/s Ratio Perm		0.14			c0.24	0.03		0.16	0.03	c0.31		
v/c Ratio		0.42			0.75	0.09		0.50	0.09	0.86	0.36	
Uniform Delay, d1		21.1			24.1	18.8		22.4	19.5	11.8	9.1	
Progression Factor		1.00			0.82	0.45		0.87	1.28	1.00	1.00	
Incremental Delay, d2		2.1			11.8	0.3		2.6	0.4	15.5	1.0	
Delay (s)		23.2			31.7	8.8		22.1	25.3	27.3	10.1	
Level of Service		C			C	A		C	C	C	B	
Approach Delay (s)		23.2			24.1			23.1			19.9	
Approach LOS		C			C			C			B	

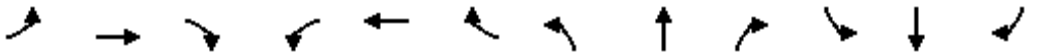
Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1589	1652		1677	1874	1369		3234			3480	1527
Flt Permitted	0.58	1.00		0.32	1.00	1.00		0.67			0.67	1.00
Satd. Flow (perm)	978	1652		562	1874	1369		2189			2345	1527
Volume (vph)	40	200	188	55	176	35	97	311	91	106	353	41
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	238	219	62	210	49	156	389	99	129	430	76
RTOR Reduction (vph)	0	41	0	0	0	29	0	18	0	0	0	39
Lane Group Flow (vph)	49	416	0	62	210	20	0	626	0	0	559	37
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	403	681		232	773	565		1067			1143	744
v/s Ratio Prot		c0.25			0.11							
v/s Ratio Perm	0.05			0.11		0.01		c0.29			0.24	0.02
v/c Ratio	0.12	0.61		0.27	0.27	0.04		0.59			0.49	0.05
Uniform Delay, d1	14.5	18.5		15.5	15.5	14.0		14.7			13.8	10.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.65			0.80	0.57
Incremental Delay, d2	0.6	4.1		2.8	0.9	0.1		2.1			1.4	0.1
Delay (s)	15.1	22.6		18.3	16.4	14.1		11.7			12.5	6.2
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		21.9			16.4			11.7			11.7	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.91		1.00	1.00	0.68
Flpb, ped/bikes	0.74	1.00	1.00		0.93	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1189	1564	545		1307	802	1658	1615		1790	1773	1021
Flt Permitted	0.56	1.00	1.00		0.92	1.00	0.35	1.00		0.31	1.00	1.00
Satd. Flow (perm)	703	1564	545		1206	802	615	1615		576	1773	1021
Volume (vph)	80	193	93	35	170	67	43	395	56	62	403	49
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	131	230	112	41	189	81	59	454	81	93	480	53
RTOR Reduction (vph)	0	0	66	0	0	48	0	8	0	0	0	27
Lane Group Flow (vph)	131	230	46	0	230	33	59	527	0	93	480	26
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	30.0	30.0	30.0		30.0	30.0	36.0	36.0		36.0	36.0	36.0
Effective Green, g (s)	33.0	33.0	33.0		33.0	33.0	39.0	39.0		39.0	39.0	39.0
Actuated g/C Ratio	0.41	0.41	0.41		0.41	0.41	0.49	0.49		0.49	0.49	0.49
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	290	645	225		497	331	300	787		281	864	498
v/s Ratio Prot		0.15						c0.33			0.27	
v/s Ratio Perm	0.19		0.08		c0.19	0.04	0.10			0.16		0.03
v/c Ratio	0.45	0.36	0.21		0.46	0.10	0.20	0.67		0.33	0.56	0.05
Uniform Delay, d1	17.0	16.2	15.1		17.1	14.4	11.6	15.6		12.5	14.4	10.8
Progression Factor	1.00	1.00	1.00		0.78	0.48	1.03	1.17		0.74	0.76	0.52
Incremental Delay, d2	5.0	1.5	2.1		3.0	0.6	1.4	4.2		3.0	2.4	0.2
Delay (s)	22.0	17.7	17.1		16.3	7.5	13.3	22.5		12.3	13.3	5.8
Level of Service	C	B	B		B	A	B	C		B	B	A
Approach Delay (s)		18.8			14.0			21.5			12.5	
Approach LOS		B			B			C			B	

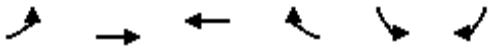
Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	16	64	421	0	10	484
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	70	458	0	11	526
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.90	0.88			0.88	
vC, conflicting volume	1211	615			530	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1029	560			463	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	83			99	
cM capacity (veh/h)	191	402			903	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	87	458	537
Volume Left	17	0	11
Volume Right	70	0	0
cSH	330	1700	903
Volume to Capacity	0.26	0.27	0.01
Queue Length 95th (m)	7.9	0.0	0.3
Control Delay (s)	19.8	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	19.8	0.0	0.3
Approach LOS	C		

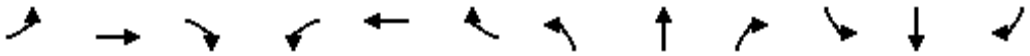
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	8	342	223	4	20	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	372	242	4	22	26
Pedestrians		1	3		80	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	327				717	326
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	327				717	326
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	96
cM capacity (veh/h)	1148				366	666

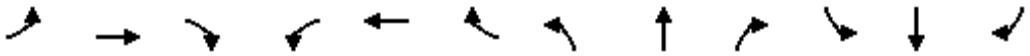
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	380	247	48
Volume Left	9	0	22
Volume Right	0	4	26
cSH	1148	1700	485
Volume to Capacity	0.01	0.15	0.10
Queue Length 95th (m)	0.2	0.0	2.5
Control Delay (s)	0.3	0.0	13.2
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	13.2
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		0.91			1.00						0.79	
Flpb, ped/bikes		1.00			1.00						0.93	
Frt		0.98			1.00						0.95	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1424			1364						1495	
Flt Permitted		1.00			1.00						0.99	
Satd. Flow (perm)		1424			1364						1495	
Volume (vph)	0	255	39	0	206	0	0	0	0	20	73	55
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	0	304	53	0	240	0	0	0	0	27	95	76
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	28	0
Lane Group Flow (vph)	0	349	0	0	240	0	0	0	0	0	170	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type										Perm		
Protected Phases		4			8						6	
Permitted Phases										6		
Actuated Green, G (s)		48.0			48.0						20.0	
Effective Green, g (s)		50.0			50.0						22.0	
Actuated g/C Ratio		0.62			0.62						0.28	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		890			853						411	
v/s Ratio Prot		c0.25			0.18							
v/s Ratio Perm											0.11	
v/c Ratio		0.39			0.28						0.41	
Uniform Delay, d1		7.5			6.8						23.7	
Progression Factor		0.72			0.81						0.92	
Incremental Delay, d2		1.2			0.7						2.9	
Delay (s)		6.6			6.3						24.8	
Level of Service		A			A						C	
Approach Delay (s)		6.6			6.3			0.0			24.8	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			1%			2%			-4%	
Volume (veh/h)	15	256	0	0	194	129	4	25	19	0	0	0
Peak Hour Factor	0.65	0.92	0.38	0.83	0.75	0.88	0.33	0.50	0.67	0.42	0.92	0.58
Hourly flow rate (vph)	23	278	0	0	259	147	12	50	28	0	0	0
Pedestrians		96			2			216			324	
Lane Width (m)		3.0			3.0			3.9			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			0			20			0	
Right turn flare (veh)									4			
Median type								None			None	
Median storage veh)												
Upstream signal (m)		81			80							
pX, platoon unblocked	0.95			0.95			0.97	0.97	0.95	0.97	0.97	0.95
vC, conflicting volume	729			494			968	1270	496	1022	1196	752
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	715			467			889	1199	469	944	1124	739
tC, single (s)	4.1			4.2			7.1	6.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	97			100			93	65	93	100	100	100
cM capacity (veh/h)	849			817			162	142	419	136	158	373

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	301	405	90
Volume Left	23	0	12
Volume Right	0	147	28
cSH	849	1700	213
Volume to Capacity	0.03	0.24	0.42
Queue Length 95th (m)	0.6	0.0	14.9
Control Delay (s)	1.0	0.0	36.5
Lane LOS	A		E
Approach Delay (s)	1.0	0.0	36.5
Approach LOS			E

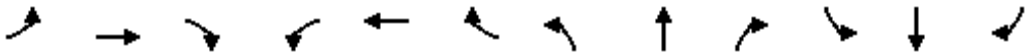
Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	46	17	102	0	0	386
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	18	111	0	0	420
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			61			237
pX, platoon unblocked						
vC, conflicting volume	575	157			132	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	575	157			132	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	98			100	
cM capacity (veh/h)	461	854			1427	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	111	420
Volume Left	50	0	0
Volume Right	18	0	0
cSH	526	1700	1700
Volume to Capacity	0.13	0.07	0.25
Queue Length 95th (m)	3.4	0.0	0.0
Control Delay (s)	12.9	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.9	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.90		1.00	0.98		1.00	0.79			0.88	
Flpb, ped/bikes	0.58	1.00		0.71	1.00		1.00	1.00			0.98	
Frt	1.00	0.97		1.00	0.99		1.00	0.90			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	984	1384		1173	1398		1503	1350			1739	
Flt Permitted	0.58	1.00		0.52	1.00		0.33	1.00			0.89	
Satd. Flow (perm)	606	1384		637	1398		516	1350			1566	
Volume (vph)	32	215	45	138	214	7	40	85	130	35	237	115
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	53	269	58	175	238	9	48	96	171	64	269	144
RTOR Reduction (vph)	0	10	0	0	2	0	0	80	0	0	19	0
Lane Group Flow (vph)	53	317	0	175	245	0	48	187	0	0	458	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.0	43.0		43.0	43.0		25.0	25.0			25.0	
Effective Green, g (s)	45.0	45.0		45.0	45.0		27.0	27.0			27.0	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.34	0.34			0.34	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	341	779		358	786		174	456			529	
v/s Ratio Prot		0.23			0.18			0.14				
v/s Ratio Perm	0.09			c0.27			0.09				c0.29	
v/c Ratio	0.16	0.41		0.49	0.31		0.28	0.41			0.87	
Uniform Delay, d1	8.4	9.9		10.6	9.3		19.4	20.4			24.8	
Progression Factor	0.75	0.63		1.00	1.00		1.00	1.00			0.96	
Incremental Delay, d2	0.9	1.5		4.7	1.0		3.9	2.7			15.4	
Delay (s)	7.2	7.8		15.3	10.3		23.3	23.1			39.2	
Level of Service	A	A		B	B		C	C			D	
Approach Delay (s)		7.7			12.4			23.1			39.2	
Approach LOS		A			B			C			D	

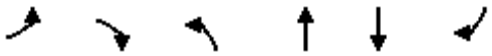
Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	308	46	32	218	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	335	50	35	237	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.92		0.93	0.92
vC, conflicting volume			385		966	360
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			333		927	306
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1132		214	677

Direction, Lane #	EB 1	WB 1
Volume Total	385	272
Volume Left	0	35
Volume Right	50	0
cSH	1700	1132
Volume to Capacity	0.23	0.03
Queue Length 95th (m)	0.0	0.7
Control Delay (s)	0.0	1.3
Lane LOS		A
Approach Delay (s)	0.0	1.3
Approach LOS		

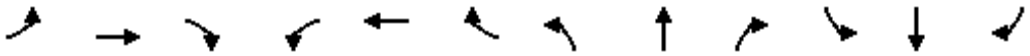
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	0	0	17	86	136	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	18	93	148	22
Pedestrians	24					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	313	183	194			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	313	183	194			
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	100	99			
cM capacity (veh/h)	670	860	1380			

Direction, Lane #	NB 1	SB 1
Volume Total	112	170
Volume Left	18	0
Volume Right	0	22
cSH	1380	1700
Volume to Capacity	0.01	0.10
Queue Length 95th (m)	0.3	0.0
Control Delay (s)	1.4	0.0
Lane LOS	A	
Approach Delay (s)	1.4	0.0
Approach LOS		

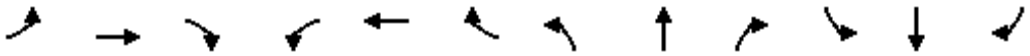
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	7	0	1	20	0	12	0	11	18	29	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	0	1	22	0	13	0	12	20	32	28
Pedestrians		75			31			31			28	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	231	229	152	183	237	65	135			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	231	229	152	183	237	65	135			43		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	96	100	99			99		
cM capacity (veh/h)	589	597	815	670	591	949	1357			1524		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	23	25	79
Volume Left	0	1	13	20
Volume Right	0	0	12	28
cSH	597	595	1357	1524
Volume to Capacity	0.01	0.04	0.01	0.01
Queue Length 95th (m)	0.3	0.9	0.2	0.3
Control Delay (s)	11.1	11.3	4.0	1.9
Lane LOS	B	B	A	A
Approach Delay (s)	11.1	11.3	4.0	1.9
Approach LOS	B	B		

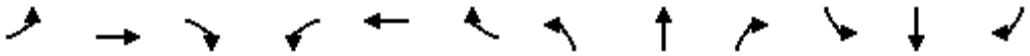
Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	16	11	4	2	19	31	6	22	1	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)	17	12	4	2	21	34	7	24	1	0	0	0
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	140	122	90	124	122	68	49			60		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140	122	90	124	122	68	49			60		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	100	100	97	97	100			100		
cM capacity (veh/h)	708	711	895	737	711	965	1492			1497		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	34	57	32
Volume Left	17	2	7
Volume Right	4	34	1
cSH	729	845	1492
Volume to Capacity	0.05	0.07	0.00
Queue Length 95th (m)	1.1	1.6	0.1
Control Delay (s)	10.2	9.6	1.6
Lane LOS	B	A	A
Approach Delay (s)	10.2	9.6	1.6
Approach LOS	B	A	

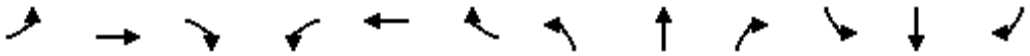
Intersection Summary				
Average Delay		7.7		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	7	0	2	47	0	4	0	0	0	55	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	0	2	51	0	4	0	0	0	60	26
Pedestrians		90			18			48			50	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	247	190	211	151	203	68	176			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	247	190	211	151	203	68	176			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	92	100	100			100		
cM capacity (veh/h)	544	639	734	708	628	938	1292			1574		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	53	4	86
Volume Left	0	2	4	0
Volume Right	0	0	0	26
cSH	639	631	1292	1574
Volume to Capacity	0.01	0.08	0.00	0.00
Queue Length 95th (m)	0.3	2.1	0.1	0.0
Control Delay (s)	10.7	11.2	7.8	0.0
Lane LOS	B	B	A	
Approach Delay (s)	10.7	11.2	7.8	0.0
Approach LOS	B	B		

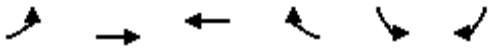
Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	31.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	11	0	6	3	2	3	11	234	7	60	319	32
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)	12	0	7	3	2	3	12	254	8	65	347	35
Pedestrians		85			165			17			83	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			14			1			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	949	1030	466	965	1044	506	467			427		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	949	1030	466	965	1044	506	467			427		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	99	98	99	99	99			93		
cM capacity (veh/h)	162	171	545	156	168	452	1015			972		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	9	274	447
Volume Left	12	3	12	65
Volume Right	7	3	8	35
cSH	215	212	1015	972
Volume to Capacity	0.09	0.04	0.01	0.07
Queue Length 95th (m)	2.1	1.0	0.3	1.6
Control Delay (s)	23.3	22.7	0.5	2.0
Lane LOS	C	C	A	A
Approach Delay (s)	23.3	22.7	0.5	2.0
Approach LOS	C	C		

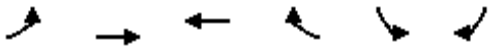
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	25	358	220	8	11	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	389	239	9	12	0
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		166				
pX, platoon unblocked						
vC, conflicting volume	279				778	387
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	279				778	387
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	100
cM capacity (veh/h)	1250				330	581

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	416	248	12
Volume Left	27	0	12
Volume Right	0	9	0
cSH	1250	1700	330
Volume to Capacity	0.02	0.15	0.04
Queue Length 95th (m)	0.5	0.0	0.9
Control Delay (s)	0.7	0.0	16.3
Lane LOS	A		C
Approach Delay (s)	0.7	0.0	16.3
Approach LOS			C

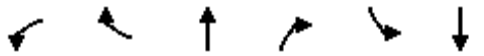
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	14	337	250	6	8	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	366	272	7	9	12
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	327				820	457
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	327				820	457
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1181				298	512

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	382	278	21
Volume Left	15	0	9
Volume Right	0	7	12
cSH	1181	1700	394
Volume to Capacity	0.01	0.16	0.05
Queue Length 95th (m)	0.3	0.0	1.3
Control Delay (s)	0.5	0.0	14.7
Lane LOS	A		B
Approach Delay (s)	0.5	0.0	14.7
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	0	0	0	0	34	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	37	201
Pedestrians	20					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	295	20			20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	295	20			20	
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	100			98	
cM capacity (veh/h)	680	1058			1596	

Direction, Lane #	SB 1
Volume Total	238
Volume Left	37
Volume Right	0
cSH	1596
Volume to Capacity	0.02
Queue Length 95th (m)	0.5
Control Delay (s)	1.3
Lane LOS	A
Approach Delay (s)	1.3
Approach LOS	

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	14.9%	ICU Level of Service	A
Analysis Period (min)	15		

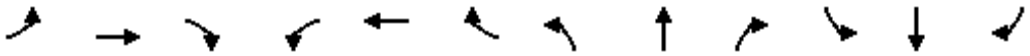
63: Queen St & Birmingham Street Performance by approach

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.1	0.0	0.2	0.0	0.3
Delay / Veh (s)	0.8	0.4	4.3	4.2	1.7
Total Stops	0	0	61	12	73
Travel Dist (km)	34.2	10.4	12.8	1.6	59.0
Travel Time (hr)	1.0	0.3	0.6	0.1	1.9
Avg Speed (kph)	35	38	22	20	31
Vehicles Entered	297	105	144	22	568
Vehicles Exited	296	105	144	22	567
Hourly Exit Rate	296	105	144	22	567

177: Spring Garden Road & Brunswick Street Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.3	0.1	1.4	1.8
Delay / Veh (s)	2.4	1.9	27.3	7.8
Total Stops	73	26	164	263
Travel Dist (km)	17.4	18.6	8.5	44.5
Travel Time (hr)	0.7	0.6	1.7	3.0
Avg Speed (kph)	26	31	5	15
Vehicles Entered	377	271	188	836
Vehicles Exited	378	271	184	833
Hourly Exit Rate	378	271	184	833

Scenario D 2020 PM with background traffic growth



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.92		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	0.96	1.00			0.96		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1476	1547			1418		1594	1607		1412	1416	
Flt Permitted	0.45	1.00			0.90		0.15	1.00		0.30	1.00	
Satd. Flow (perm)	705	1547			1292		258	1607		450	1416	
Volume (vph)	446	284	32	16	109	76	53	319	31	85	170	410
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	474	326	44	36	122	85	68	389	44	99	189	519
RTOR Reduction (vph)	0	7	0	0	27	0	0	6	0	0	137	0
Lane Group Flow (vph)	474	363	0	0	216	0	68	427	0	99	571	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			20.0		24.0	24.0		24.0	24.0	
Effective Green, g (s)	38.0	38.0			22.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.53	0.53			0.31		0.36	0.36		0.36	0.36	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	501	816			395		93	580		163	511	
v/s Ratio Prot	c0.16	0.23						0.27			c0.40	
v/s Ratio Perm	c0.34				0.17		0.26			0.22		
v/c Ratio	0.95	0.45			0.55		0.73	0.74		0.61	1.12	
Uniform Delay, d1	15.5	10.5			20.8		20.0	20.0		18.8	23.0	
Progression Factor	1.00	1.00			1.23		1.00	1.00		0.89	0.75	
Incremental Delay, d2	28.8	1.8			5.3		39.6	8.1		14.3	74.1	
Delay (s)	44.3	12.3			31.0		59.6	28.1		31.0	91.3	
Level of Service	D	B			C		E	C		C	F	
Approach Delay (s)		30.3			31.0			32.4			83.9	
Approach LOS		C			C			C			F	

Intersection Summary			
HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.95			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1744			3637	1771	1486
Flt Permitted	1.00			0.66	0.95	1.00
Satd. Flow (perm)	1744			2406	1771	1486
Volume (vph)	625	99	73	532	225	348
Peak-hour factor, PHF	0.87	0.92	0.87	0.87	0.92	0.93
Adj. Flow (vph)	718	108	84	611	245	374
RTOR Reduction (vph)	7	0	0	0	0	105
Lane Group Flow (vph)	819	0	0	695	245	269
Confl. Peds. (#/hr)		75	75		9	3
Confl. Bikes (#/hr)		14				9
Heavy Vehicles (%)	1%	2%	0%	2%	1%	3%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	44.0			44.0	22.0	22.0
Effective Green, g (s)	47.0			47.0	25.0	25.0
Actuated g/C Ratio	0.59			0.59	0.31	0.31
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1025			1414	553	464
v/s Ratio Prot	c0.47				0.14	
v/s Ratio Perm				0.29		c0.18
v/c Ratio	0.80			0.49	0.44	0.58
Uniform Delay, d1	12.8			9.6	21.9	23.1
Progression Factor	0.91			1.00	1.27	1.44
Incremental Delay, d2	6.2			1.2	2.4	4.9
Delay (s)	17.9			10.8	30.3	38.2
Level of Service	B			B	C	D
Approach Delay (s)	17.9			10.8	35.1	
Approach LOS	B			B	D	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

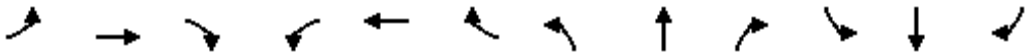
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	474	56	87	567	0	0
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	539	77	147	659	0	0
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.91		0.95	0.91
vC, conflicting volume			650		1240	615
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			615		1020	576
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		100	100
cM capacity (veh/h)			873		183	417

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	615	367	440
Volume Left	0	147	0
Volume Right	77	0	0
cSH	1700	873	1700
Volume to Capacity	0.36	0.17	0.26
Queue Length 95th (m)	0.0	4.6	0.0
Control Delay (s)	0.0	5.2	0.0
Lane LOS		A	
Approach Delay (s)	0.0	2.3	
Approach LOS			

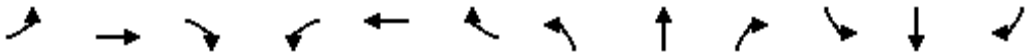
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	127	195	53	45	316	153	80	216	48	27	132	74
Peak Hour Factor	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Hourly flow rate (vph)	157	257	67	69	329	184	114	254	53	40	157	87

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	480	398	184	422	285
Volume Left (vph)	157	69	0	114	40
Volume Right (vph)	67	0	184	53	87
Hadj (s)	0.02	0.12	-0.67	0.01	-0.12
Departure Headway (s)	9.0	9.3	8.5	8.9	9.4
Degree Utilization, x	1.20	1.02	0.43	1.04	0.74
Capacity (veh/h)	401	398	422	409	376
Control Delay (s)	139.9	82.0	16.6	86.4	35.2
Approach Delay (s)	139.9	61.3		86.4	35.2
Approach LOS	F	F		F	E

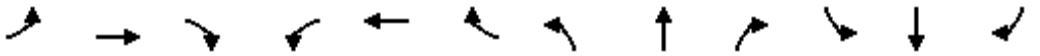
Intersection Summary				
Delay	84.4			
HCM Level of Service	F			
Intersection Capacity Utilization	84.3%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1726	1500		1858	1353	1668	1798	
Flt Permitted		0.98			0.80	1.00		0.97	1.00	0.12	1.00	
Satd. Flow (perm)		1922			1402	1500		1811	1353	211	1798	
Volume (vph)	12	175	50	96	214	391	30	541	169	246	250	16
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	188	54	97	216	395	31	564	176	251	255	16
RTOR Reduction (vph)	0	12	0	0	0	217	0	0	110	0	3	0
Lane Group Flow (vph)	0	243	0	0	313	178	0	595	66	251	268	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		26.0			26.0	26.0		27.0	27.0	40.0	40.0	
Effective Green, g (s)		29.0			29.0	29.0		30.0	30.0	43.0	43.0	
Actuated g/C Ratio		0.36			0.36	0.36		0.38	0.38	0.54	0.54	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		697			508	544		679	507	277	966	
v/s Ratio Prot										c0.10	0.15	
v/s Ratio Perm		0.13			c0.22	0.12		0.33	0.05	c0.38		
v/c Ratio		0.35			0.62	0.33		0.88	0.13	0.91	0.28	
Uniform Delay, d1		18.6			20.9	18.4		23.3	16.4	18.6	10.1	
Progression Factor		1.00			0.85	0.62		0.82	1.32	1.00	1.00	
Incremental Delay, d2		1.4			5.0	1.5		10.0	0.3	34.5	0.7	
Delay (s)		20.0			22.9	12.9		29.2	22.0	53.1	10.8	
Level of Service		B			C	B		C	C	D	B	
Approach Delay (s)		20.0			17.3			27.5			31.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

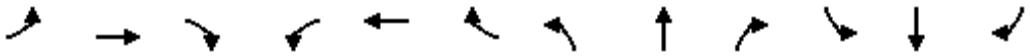
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.95			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Satd. Flow (prot)	1689	1694		1667	1892	1316		3145			3408	1386
Flt Permitted	0.37	1.00		0.35	1.00	1.00		0.78			0.61	1.00
Satd. Flow (perm)	650	1694		616	1892	1316		2471			2118	1386
Volume (vph)	83	228	97	84	398	75	124	478	106	62	207	46
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	108	281	143	99	410	95	170	525	143	103	233	54
RTOR Reduction (vph)	0	23	0	0	0	41	0	22	0	0	0	28
Lane Group Flow (vph)	108	401	0	99	410	54	0	816	0	0	336	26
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	268	699		254	780	543		1205			1033	676
v/s Ratio Prot		c0.24			0.22							
v/s Ratio Perm	0.17			0.16		0.04		c0.33			0.16	0.02
v/c Ratio	0.40	0.57		0.39	0.53	0.10		0.68			0.33	0.04
Uniform Delay, d1	16.6	18.1		16.5	17.6	14.4		15.7			12.5	10.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.87			0.79	0.71
Incremental Delay, d2	4.4	3.4		4.5	2.5	0.4		2.6			0.8	0.1
Delay (s)	21.0	21.6		20.9	20.2	14.8		16.2			10.6	7.7
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		21.4			19.4			16.2			10.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

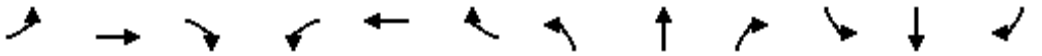
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	15	0	7	80	0	35	0	15	25	38	56
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	8	87	0	38	0	16	27	41	61
Pedestrians		45			51			36			74	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	373	314	153	305	337	133	147			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	373	314	153	305	337	133	147			67		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	100	99	83	100	97			98		
cM capacity (veh/h)	416	527	832	531	513	820	1379			1467		

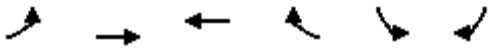
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	95	54	129
Volume Left	0	8	38	27
Volume Right	0	0	16	61
cSH	527	514	1379	1467
Volume to Capacity	0.03	0.18	0.03	0.02
Queue Length 95th (m)	0.7	5.1	0.6	0.4
Control Delay (s)	12.0	13.6	5.4	1.7
Lane LOS	B	B	A	A
Approach Delay (s)	12.0	13.6	5.4	1.7
Approach LOS	B	B		

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	32.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.89		1.00	1.00	0.56
Flpb, ped/bikes	0.75	1.00	1.00		0.94	1.00	0.81	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1212	1448	355		1505	684	1399	1586		1723	1739	855
Flt Permitted	0.49	1.00	1.00		0.93	1.00	0.49	1.00		0.17	1.00	1.00
Satd. Flow (perm)	620	1448	355		1414	684	715	1586		317	1739	855
Volume (vph)	71	224	53	31	197	111	118	551	82	65	293	67
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	76	252	63	40	263	131	142	580	102	83	326	81
RTOR Reduction (vph)	0	0	27	0	0	10	0	8	0	0	0	1
Lane Group Flow (vph)	76	252	36	0	303	121	142	674	0	83	326	80
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	31.0	31.0	31.0		31.0	31.0	35.0	35.0		35.0	35.0	35.0
Effective Green, g (s)	34.0	34.0	34.0		34.0	34.0	38.0	38.0		38.0	38.0	38.0
Actuated g/C Ratio	0.42	0.42	0.42		0.42	0.42	0.48	0.48		0.48	0.48	0.48
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	264	615	151		601	291	340	753		151	826	406
v/s Ratio Prot		0.17						c0.43			0.19	
v/s Ratio Perm	0.12		0.10		c0.21	0.18	0.20			0.26		0.09
v/c Ratio	0.29	0.41	0.24		0.50	0.42	0.42	0.90		0.55	0.39	0.20
Uniform Delay, d1	15.1	16.0	14.7		16.8	16.1	13.8	19.2		14.9	13.6	12.2
Progression Factor	1.09	1.02	1.27		0.75	0.72	1.00	1.06		0.76	0.77	0.76
Incremental Delay, d2	2.4	1.8	3.3		2.9	4.2	3.5	14.7		13.2	1.4	1.0
Delay (s)	18.9	18.1	21.9		15.6	15.7	17.3	35.0		24.6	11.9	10.3
Level of Service	B	B	C		B	B	B	D		C	B	B
Approach Delay (s)		18.8			15.6			32.0			13.8	
Approach LOS		B			B			C			B	

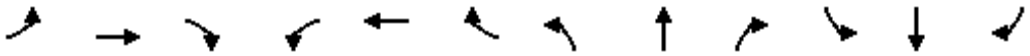
Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	13	274	451	8	26	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	298	490	9	28	62
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	583				908	579
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583				908	579
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				90	87
cM capacity (veh/h)	920				279	478

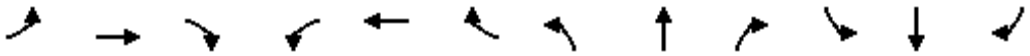
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	312	499	90
Volume Left	14	0	28
Volume Right	0	9	62
cSH	920	1700	391
Volume to Capacity	0.02	0.29	0.23
Queue Length 95th (m)	0.4	0.0	6.7
Control Delay (s)	0.6	0.0	17.0
Lane LOS	A		C
Approach Delay (s)	0.6	0.0	17.0
Approach LOS			C

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		0.85			1.00						0.73	
Flpb, ped/bikes		1.00			1.00						0.90	
Frt		0.98			1.00						0.94	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1259			1598						1321	
Flt Permitted		1.00			1.00						0.99	
Satd. Flow (perm)		1259			1598						1321	
Volume (vph)	0	264	36	0	315	0	0	0	0	12	64	73
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	0	293	58	0	358	0	0	0	0	31	94	91
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	16	0
Lane Group Flow (vph)	0	342	0	0	358	0	0	0	0	0	200	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type										Perm		
Protected Phases		4			8						6	
Permitted Phases										6		
Actuated Green, G (s)		48.0			48.0						20.0	
Effective Green, g (s)		50.0			50.0						22.0	
Actuated g/C Ratio		0.62			0.62						0.28	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		787			999						363	
v/s Ratio Prot		c0.27			0.22							
v/s Ratio Perm											0.15	
v/c Ratio		0.43			0.36						0.55	
Uniform Delay, d1		7.7			7.2						24.8	
Progression Factor		1.14			0.78						0.95	
Incremental Delay, d2		1.5			0.9						5.8	
Delay (s)		10.3			6.5						29.4	
Level of Service		B			A						C	
Approach Delay (s)		10.3			6.5			0.0			29.4	
Approach LOS		B			A			A			C	

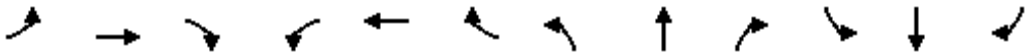
Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			1%			2%			-4%	
Volume (veh/h)	15	298	0	0	318	102	9	56	66	0	0	0
Peak Hour Factor	0.81	0.91	0.68	0.71	0.84	0.76	0.75	0.95	0.75	0.50	0.74	0.78
Hourly flow rate (vph)	19	327	0	0	379	134	12	59	88	0	0	0
Pedestrians		122			22			297			436	
Lane Width (m)		3.0			3.0			3.9			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			27			0	
Right turn flare (veh)									4			
Median type								None			None	
Median storage veh)												
Upstream signal (m)		80			81							
pX, platoon unblocked	0.87			0.95			0.89	0.89	0.95	0.89	0.89	0.87
vC, conflicting volume	949			624			1229	1610	646	1342	1543	1004
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	941			605			1176	1603	628	1302	1528	1004
tC, single (s)	4.2			4.1			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	97			100			84	12	74	100	100	100
cM capacity (veh/h)	614			684			74	67	333	18	75	235

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	346	513	159
Volume Left	19	0	12
Volume Right	0	134	88
cSH	614	1700	147
Volume to Capacity	0.03	0.30	1.08
Queue Length 95th (m)	0.7	0.0	64.5
Control Delay (s)	1.0	0.0	157.7
Lane LOS	A		F
Approach Delay (s)	1.0	0.0	157.7
Approach LOS			F

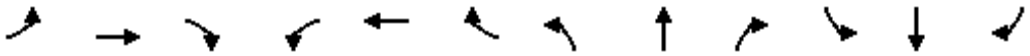
Intersection Summary			
Average Delay	25.0		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	33	25	6	8	75	44	10	33	11	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)	36	27	7	9	82	48	11	36	12	0	0	0
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	295	204	123	191	198	169	75			107		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	295	204	123	191	198	169	75			107		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	96	99	99	87	94	99			100		
cM capacity (veh/h)	474	611	833	611	615	831	1426			1409		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	70	138	59
Volume Left	36	9	11
Volume Right	7	48	12
cSH	544	676	1426
Volume to Capacity	0.13	0.20	0.01
Queue Length 95th (m)	3.3	5.8	0.2
Control Delay (s)	12.6	11.7	1.4
Lane LOS	B	B	A
Approach Delay (s)	12.6	11.7	1.4
Approach LOS	B	B	

Intersection Summary				
Average Delay	9.7			
Intersection Capacity Utilization	32.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.89		1.00	0.93		1.00	0.77			0.77	
Flpb, ped/bikes	0.64	1.00		0.66	1.00		0.77	1.00			1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1163	1306		1109	1469		1262	1340			1371	
Flt Permitted	0.49	1.00		0.48	1.00		0.51	1.00			0.70	
Satd. Flow (perm)	598	1306		563	1469		676	1340			964	
Volume (vph)	55	268	36	104	258	26	112	225	260	45	138	100
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	60	285	49	149	300	28	156	245	280	49	150	109
RTOR Reduction (vph)	0	8	0	0	4	0	0	25	0	0	22	0
Lane Group Flow (vph)	60	326	0	149	324	0	156	500	0	0	286	0
Confl. Peds. (#/hr)	435		420	420		435	271		340	340		271
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	37.0		37.0	37.0		31.0	31.0			31.0	
Effective Green, g (s)	39.0	39.0		39.0	39.0		33.0	33.0			33.0	
Actuated g/C Ratio	0.49	0.49		0.49	0.49		0.41	0.41			0.41	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	292	637		274	716		279	553			398	
v/s Ratio Prot		0.25			0.22			c0.37				
v/s Ratio Perm	0.10			c0.26			0.23				0.30	
v/c Ratio	0.21	0.51		0.54	0.45		0.56	0.90			0.72	
Uniform Delay, d1	11.7	14.0		14.3	13.5		17.9	22.0			19.6	
Progression Factor	0.56	0.53		1.00	1.00		1.00	1.00			1.05	
Incremental Delay, d2	1.5	2.8		7.6	2.1		7.9	20.7			10.2	
Delay (s)	8.1	10.2		21.8	15.5		25.8	42.7			30.8	
Level of Service	A	B		C	B		C	D			C	
Approach Delay (s)		9.8			17.5			38.8			30.8	
Approach LOS		A			B			D			C	

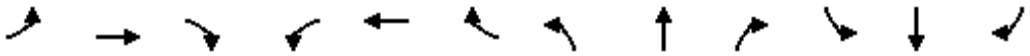
Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	352	77	57	306	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	383	84	62	333	0	0
Pedestrians	591			3	630	
Lane Width (m)	3.0			3.0	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	41			0	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.90		0.95	0.90
vC, conflicting volume			1096		2102	1057
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1106		2034	1063
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			89		100	100
cM capacity (veh/h)			571		31	245

Direction, Lane #	EB 1	WB 1
Volume Total	466	395
Volume Left	0	62
Volume Right	84	0
cSH	1700	571
Volume to Capacity	0.27	0.11
Queue Length 95th (m)	0.0	2.8
Control Delay (s)	0.0	3.3
Lane LOS		A
Approach Delay (s)	0.0	3.3
Approach LOS		

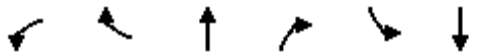
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	15	0	11	159	0	48	0	0	0	52	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	12	173	0	52	0	0	0	57	80
Pedestrians		28			32			60			84	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	400	261	185	301	301	116	165			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	400	261	185	301	301	116	165			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	100	98	69	100	96			100		
cM capacity (veh/h)	362	588	794	549	558	845	1379			1537		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	185	52	137
Volume Left	0	12	52	0
Volume Right	0	0	0	80
cSH	588	558	1379	1537
Volume to Capacity	0.03	0.33	0.04	0.00
Queue Length 95th (m)	0.6	11.0	0.9	0.0
Control Delay (s)	11.3	14.6	7.7	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.3	14.6	7.7	0.0
Approach LOS	B	B		

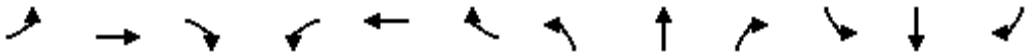
Intersection Summary				
Average Delay	8.4			
Intersection Capacity Utilization	47.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	39	293	530	0	16	276
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	318	576	0	17	300
Pedestrians	52		163			169
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.86	0.84			0.84	
vC, conflicting volume	1126	797			628	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1058	757			555	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	0			98	
cM capacity (veh/h)	172	278			811	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	361	576	317
Volume Left	42	0	17
Volume Right	318	0	0
cSH	260	1700	811
Volume to Capacity	1.39	0.34	0.02
Queue Length 95th (m)	148.7	0.0	0.5
Control Delay (s)	234.5	0.0	0.8
Lane LOS	F		A
Approach Delay (s)	234.5	0.0	0.8
Approach LOS	F		

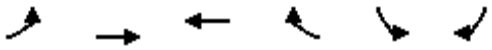
Intersection Summary			
Average Delay	67.7		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	27	4	2	2	22	48	38	476	1	2	183	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	4	2	2	24	52	41	517	1	2	199	98
Pedestrians		94			157			19			78	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			13			2			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	1089	1104	361	1033	1153	753	391			675		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1089	1104	361	1033	1153	753	391			675		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	97	100	98	84	84	96			100		
cM capacity (veh/h)	101	161	618	143	151	331	1074			793		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	78	560	299
Volume Left	29	2	41	2
Volume Right	2	52	1	98
cSH	111	236	1074	793
Volume to Capacity	0.32	0.33	0.04	0.00
Queue Length 95th (m)	9.6	10.6	0.9	0.1
Control Delay (s)	52.0	27.6	1.1	0.1
Lane LOS	F	D	A	A
Approach Delay (s)	52.0	27.6	1.1	0.1
Approach LOS	F	D		

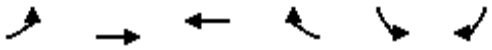
Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	33	343	442	7	20	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	373	480	8	22	28
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		168				
pX, platoon unblocked						
vC, conflicting volume	519				1020	628
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	519				1020	628
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				91	93
cM capacity (veh/h)	1019				234	424

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	488	50
Volume Left	36	0	22
Volume Right	0	8	28
cSH	1019	1700	313
Volume to Capacity	0.04	0.29	0.16
Queue Length 95th (m)	0.8	0.0	4.3
Control Delay (s)	1.1	0.0	18.7
Lane LOS	A		C
Approach Delay (s)	1.1	0.0	18.7
Approach LOS			C

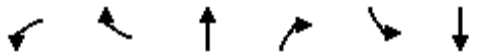
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	43	290	450	11	35	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	315	489	12	38	16
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	550				1052	677
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	550				1052	677
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				82	96
cM capacity (veh/h)	977				210	384

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	362	501	54
Volume Left	47	0	38
Volume Right	0	12	16
cSH	977	1700	243
Volume to Capacity	0.05	0.29	0.22
Queue Length 95th (m)	1.1	0.0	6.4
Control Delay (s)	1.6	0.0	24.1
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	24.1
Approach LOS			C

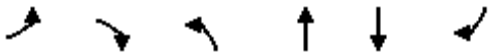
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	0	0	0	0	141	220
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	153	239
Pedestrians	102					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	648	102			102	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	648	102			102	
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	100			90	
cM capacity (veh/h)	390	953			1490	

Direction, Lane #	SB 1
Volume Total	392
Volume Left	153
Volume Right	0
cSH	1490
Volume to Capacity	0.10
Queue Length 95th (m)	2.6
Control Delay (s)	3.6
Lane LOS	A
Approach Delay (s)	3.6
Approach LOS	

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	0	0	41	351	127	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	45	382	138	63
Pedestrians	95					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	735	265	296			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	735	265	296			
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	100	96			
cM capacity (veh/h)	373	774	1265			

Direction, Lane #	NB 1	SB 1
Volume Total	426	201
Volume Left	45	0
Volume Right	0	63
cSH	1265	1700
Volume to Capacity	0.04	0.12
Queue Length 95th (m)	0.8	0.0
Control Delay (s)	1.2	0.0
Lane LOS	A	
Approach Delay (s)	1.2	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	29	27	289	0	0	253
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	29	314	0	0	275
Pedestrians			75			81
Lane Width (m)			3.7			3.7
Walking Speed (m/s)			1.2			1.2
Percent Blockage			6			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			58			237
pX, platoon unblocked						
vC, conflicting volume	664	395			314	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664	395			314	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	95			100	
cM capacity (veh/h)	398	609			1246	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	61	314	275
Volume Left	32	0	0
Volume Right	29	0	0
cSH	478	1700	1700
Volume to Capacity	0.13	0.18	0.16
Queue Length 95th (m)	3.3	0.0	0.0
Control Delay (s)	13.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.6	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

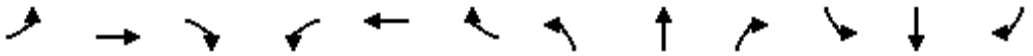
174: Queen Street & Birmingham Street Performance by approach

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.1	0.1	0.8	0.2	1.2
Delay / Veh (s)	1.1	1.2	16.4	5.7	5.6
Total Stops	5	11	186	81	283
Travel Dist (km)	23.5	23.7	21.2	10.1	78.4
Travel Time (hr)	0.7	0.6	1.5	0.6	3.4
Avg Speed (kph)	33	40	14	18	23
Vehicles Entered	218	239	186	144	787
Vehicles Exited	217	239	186	143	785
Hourly Exit Rate	217	239	186	143	785

177: Spring Garden Road & Brunswick Street Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.1	0.5	2.1	3.8
Delay / Veh (s)	7.7	3.9	65.8	12.3
Total Stops	204	103	114	421
Travel Dist (km)	24.8	34.7	6.3	65.9
Travel Time (hr)	1.7	1.4	2.4	5.6
Avg Speed (kph)	14	25	3	12
Vehicles Entered	527	455	117	1099
Vehicles Exited	525	454	117	1096
Hourly Exit Rate	525	454	117	1096

Scenario A 2020 AM with background traffic growth and development



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.90	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1462	1608			1517		1626	1625		1472	1497	
Flt Permitted	0.61	1.00			0.89		0.11	1.00		0.58	1.00	
Satd. Flow (perm)	933	1608			1362		190	1625		901	1497	
Volume (vph)	262	347	37	7	36	34	9	165	25	224	281	508
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	288	369	53	18	42	41	18	206	36	238	339	591
RTOR Reduction (vph)	0	7	0	0	31	0	0	9	0	0	87	0
Lane Group Flow (vph)	288	415	0	0	70	0	18	234	0	238	843	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.0	26.0			16.0		34.0	34.0		34.0	34.0	
Effective Green, g (s)	28.0	28.0			18.0		36.0	36.0		36.0	36.0	
Actuated g/C Ratio	0.39	0.39			0.25		0.50	0.50		0.50	0.50	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	407	625			341		95	813		451	749	
v/s Ratio Prot	0.06	c0.26						0.14			c0.56	
v/s Ratio Perm	c0.22				0.05		0.09			0.26		
v/c Ratio	0.71	0.66			0.21		0.19	0.29		0.53	1.13	
Uniform Delay, d1	19.4	18.1			21.3		9.9	10.5		12.2	18.0	
Progression Factor	1.00	1.00			1.43		1.05	1.06		0.91	0.72	
Incremental Delay, d2	10.0	5.5			1.4		4.4	0.9		3.4	69.9	
Delay (s)	29.3	23.6			31.9		14.8	12.0		14.5	83.0	
Level of Service	C	C			C		B	B		B	F	
Approach Delay (s)		25.9			31.9			12.2			69.0	
Approach LOS		C			C			B			E	

Intersection Summary			
HCM Average Control Delay	47.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	4%	
Volume (veh/h)	561	199	162	414	49	90
Peak Hour Factor	0.91	0.82	0.87	0.82	0.85	0.88
Hourly flow rate (vph)	616	243	186	505	58	102
Pedestrians	4			5	44	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	4	
Right turn flare (veh)						7
Median type					None	
Median storage veh)						
Upstream signal (m)	192			195		
pX, platoon unblocked			0.88		0.88	0.88
vC, conflicting volume			903		1411	787
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			890		1468	757
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			71		20	66
cM capacity (veh/h)			639		72	298

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	859	354	337	160
Volume Left	0	186	0	58
Volume Right	243	0	0	102
cSH	1700	639	1700	199
Volume to Capacity	0.51	0.29	0.20	0.80
Queue Length 95th (m)	0.0	9.2	0.0	43.2
Control Delay (s)	0.0	8.8	0.0	70.0
Lane LOS		A		F
Approach Delay (s)	0.0	4.5		70.0
Approach LOS				F

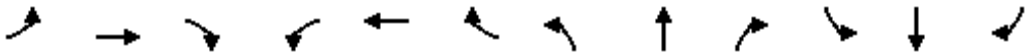
Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	848	174	121	396	37	49
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	874	179	138	450	45	59
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			229		
pX, platoon unblocked			0.72		0.72	0.72
vC, conflicting volume			1089		1501	1007
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1123		1693	1010
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			68		0	64
cM capacity (veh/h)			433		40	165

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1054	288	300	104
Volume Left	0	138	0	45
Volume Right	179	0	0	59
cSH	1700	433	1700	70
Volume to Capacity	0.62	0.32	0.18	1.48
Queue Length 95th (m)	0.0	10.2	0.0	65.8
Control Delay (s)	0.0	11.3	0.0	376.6
Lane LOS		B		F
Approach Delay (s)	0.0	5.5		376.6
Approach LOS				F

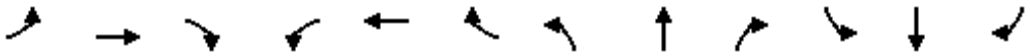
Intersection Summary			
Average Delay	24.2		
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	76	222	50	44	141	47	36	141	54	150	180	34
Peak Hour Factor	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Hourly flow rate (vph)	78	229	52	47	150	50	40	158	61	158	189	36

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	359	197	50	260	383
Volume Left (vph)	78	47	0	40	158
Volume Right (vph)	52	0	50	61	36
Hadj (s)	-0.01	0.15	-0.67	-0.08	0.06
Departure Headway (s)	7.0	7.9	7.0	7.1	6.8
Degree Utilization, x	0.70	0.43	0.10	0.51	0.73
Capacity (veh/h)	485	406	449	458	495
Control Delay (s)	24.4	15.4	9.6	17.1	25.9
Approach Delay (s)	24.4	14.3		17.1	25.9
Approach LOS	C	B		C	D

Intersection Summary				
Delay	21.3			
HCM Level of Service	C			
Intersection Capacity Utilization	81.0%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2001			1715	1502		1857	1350	1639	1812	
Flt Permitted		0.98			0.64	1.00		0.96	1.00	0.34	1.00	
Satd. Flow (perm)		1967			1119	1502		1790	1350	587	1812	
Volume (vph)	11	218	39	109	166	140	17	257	115	488	351	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	237	42	115	175	147	19	286	128	530	382	7
RTOR Reduction (vph)	0	8	0	0	0	101	0	0	90	0	1	0
Lane Group Flow (vph)	0	283	0	0	290	46	0	305	38	530	388	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		21.0	21.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		24.0	24.0	47.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.30	0.30	0.59	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		615			350	469		537	405	595	1065	
v/s Ratio Prot										c0.21	0.21	
v/s Ratio Perm		0.14			c0.26	0.03		0.17	0.03	c0.31		
v/c Ratio		0.46			0.83	0.10		0.57	0.09	0.89	0.36	
Uniform Delay, d1		22.1			25.5	19.5		23.6	20.2	11.8	8.7	
Progression Factor		1.00			1.00	1.00		0.93	1.37	1.00	1.00	
Incremental Delay, d2		2.5			19.8	0.4		3.5	0.4	18.0	1.0	
Delay (s)		24.6			45.3	19.9		25.4	27.9	29.9	9.6	
Level of Service		C			D	B		C	C	C	A	
Approach Delay (s)		24.6			36.8			26.1			21.3	
Approach LOS		C			D			C			C	

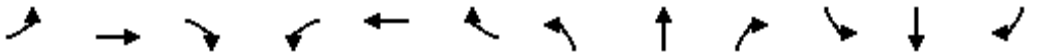
Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1592	1659		1681	1874	1369		3215			3486	1527
Flt Permitted	0.57	1.00		0.30	1.00	1.00		0.66			0.66	1.00
Satd. Flow (perm)	958	1659		538	1874	1369		2156			2338	1527
Volume (vph)	40	212	188	58	186	35	97	316	105	106	373	44
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	252	219	66	221	49	156	395	114	129	455	81
RTOR Reduction (vph)	0	39	0	0	0	29	0	22	0	0	0	42
Lane Group Flow (vph)	49	432	0	66	221	20	0	643	0	0	584	39
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	395	684		222	773	565		1051			1140	744
v/s Ratio Prot		c0.26			0.12							
v/s Ratio Perm	0.05			0.12		0.01		c0.30			0.25	0.03
v/c Ratio	0.12	0.63		0.30	0.29	0.04		0.61			0.51	0.05
Uniform Delay, d1	14.6	18.7		15.7	15.7	14.0		15.0			14.0	10.8
Progression Factor	0.97	0.92		1.00	1.00	1.00		0.65			0.86	0.63
Incremental Delay, d2	0.6	4.2		3.4	0.9	0.1		2.4			1.5	0.1
Delay (s)	14.8	21.3		19.1	16.6	14.1		12.2			13.6	6.9
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		20.7			16.7			12.2			12.8	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.89		1.00	1.00	0.68
Flpb, ped/bikes	0.76	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1220	1564	545		1318	802	1658	1571		1790	1773	1021
Flt Permitted	0.53	1.00	1.00		0.91	1.00	0.38	1.00		0.30	1.00	1.00
Satd. Flow (perm)	683	1564	545		1216	802	667	1571		569	1773	1021
Volume (vph)	79	206	97	35	181	75	46	408	72	81	396	49
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	130	245	117	41	201	90	63	469	104	121	471	53
RTOR Reduction (vph)	0	0	73	0	0	56	0	10	0	0	0	17
Lane Group Flow (vph)	130	245	44	0	242	34	63	563	0	121	471	36
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	27.0	27.0	27.0		27.0	27.0	39.0	39.0		39.0	39.0	39.0
Effective Green, g (s)	30.0	30.0	30.0		30.0	30.0	42.0	42.0		42.0	42.0	42.0
Actuated g/C Ratio	0.38	0.38	0.38		0.38	0.38	0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	256	587	204		456	301	350	825		299	931	536
v/s Ratio Prot		0.16						c0.36			0.27	
v/s Ratio Perm	0.19		0.08		c0.20	0.04	0.09			0.21		0.04
v/c Ratio	0.51	0.42	0.22		0.53	0.11	0.18	0.68		0.40	0.51	0.07
Uniform Delay, d1	19.3	18.5	17.0		19.5	16.3	10.0	14.1		11.5	12.3	9.4
Progression Factor	1.00	1.00	1.00		0.76	0.47	1.11	1.28		0.76	0.77	0.61
Incremental Delay, d2	7.0	2.2	2.4		4.2	0.7	1.1	4.3		3.8	1.8	0.2
Delay (s)	26.3	20.7	19.4		19.1	8.4	12.1	22.3		12.5	11.3	5.9
Level of Service	C	C	B		B	A	B	C		B	B	A
Approach Delay (s)		21.9			16.2			21.3			11.1	
Approach LOS		C			B			C			B	

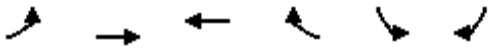
Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	34	92	425	0	0	488
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	100	462	0	0	530
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.92	0.87			0.87	
vC, conflicting volume	1198	619			534	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1008	563			466	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	75			100	
cM capacity (veh/h)	204	399			897	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	37	100	462	530
Volume Left	37	0	0	0
Volume Right	0	100	0	0
cSH	204	399	1700	1700
Volume to Capacity	0.18	0.25	0.27	0.31
Queue Length 95th (m)	4.9	7.4	0.0	0.0
Control Delay (s)	26.5	17.0	0.0	0.0
Lane LOS	D	C		
Approach Delay (s)	19.6		0.0	0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	9	363	247	5	20	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	395	268	5	22	13
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	358				772	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	358				772	355
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	1114				337	639

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	404	274	35
Volume Left	10	0	22
Volume Right	0	5	13
cSH	1114	1700	410
Volume to Capacity	0.01	0.16	0.08
Queue Length 95th (m)	0.2	0.0	2.1
Control Delay (s)	0.3	0.0	14.6
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	14.6
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.90		1.00	0.93			0.88			0.81	
Flpb, ped/bikes	0.59	1.00		0.76	1.00			0.94			0.93	
Frt	1.00	0.98		1.00	0.98			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	930	1402		1282	1278			1665			1531	
Flt Permitted	0.56	1.00		0.46	1.00			0.91			0.95	
Satd. Flow (perm)	548	1402		619	1278			1535			1472	
Volume (vph)	19	270	47	13	207	20	7	31	12	25	84	57
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	36	321	64	22	241	27	18	36	16	33	109	79
RTOR Reduction (vph)	0	9	0	0	5	0	0	10	0	0	25	0
Lane Group Flow (vph)	36	376	0	22	263	0	0	60	0	0	196	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.0	41.0		41.0	41.0			27.0			27.0	
Effective Green, g (s)	43.0	43.0		43.0	43.0			29.0			29.0	
Actuated g/C Ratio	0.54	0.54		0.54	0.54			0.36			0.36	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	295	754		333	687			556			534	
v/s Ratio Prot		c0.27			0.21							
v/s Ratio Perm	0.07			0.04				0.04			c0.13	
v/c Ratio	0.12	0.50		0.07	0.38			0.11			0.37	
Uniform Delay, d1	9.2	11.7		8.9	10.8			16.9			18.8	
Progression Factor	0.75	0.76		0.79	0.72			0.94			0.97	
Incremental Delay, d2	0.8	2.2		0.4	1.6			0.4			1.9	
Delay (s)	7.6	11.1		7.4	9.3			16.4			20.2	
Level of Service	A	B		A	A			B			C	
Approach Delay (s)		10.8			9.2			16.4			20.2	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



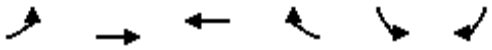
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	46	17	94	16	17	288
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	18	102	17	18	313
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			61			
pX, platoon unblocked						
vC, conflicting volume	506	157			141	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	506	157			141	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	98			99	
cM capacity (veh/h)	500	854			1417	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	120	332
Volume Left	50	0	18
Volume Right	18	17	0
cSH	563	1700	1417
Volume to Capacity	0.12	0.07	0.01
Queue Length 95th (m)	3.1	0.0	0.3
Control Delay (s)	12.3	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	12.3	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.87		1.00	0.98		1.00	0.82			0.96	
Flpb, ped/bikes		0.98		0.67	1.00		1.00	1.00			0.99	
Frt		0.97		1.00	0.99		1.00	0.92			0.99	
Flt Protected		1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		2513		1109	1400		1503	1408			2008	
Flt Permitted		0.93		0.52	1.00		0.42	1.00			0.97	
Satd. Flow (perm)		2347		604	1400		661	1408			1949	
Volume (vph)	13	226	64	141	227	7	36	112	125	12	252	25
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	22	282	83	178	252	9	43	126	164	22	286	31
RTOR Reduction (vph)	0	31	0	0	2	0	0	58	0	0	5	0
Lane Group Flow (vph)	0	356	0	178	259	0	43	232	0	0	334	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		43.0		43.0	43.0		25.0	25.0			25.0	
Effective Green, g (s)		45.0		45.0	45.0		27.0	27.0			27.0	
Actuated g/C Ratio		0.56		0.56	0.56		0.34	0.34			0.34	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1320		340	788		223	475			658	
v/s Ratio Prot					0.19			0.16				
v/s Ratio Perm		0.15		c0.29			0.07				c0.17	
v/c Ratio		0.27		0.52	0.33		0.19	0.49			0.51	
Uniform Delay, d1		9.0		10.9	9.4		18.8	21.0			21.2	
Progression Factor		0.87		1.00	1.00		1.00	1.00			1.13	
Incremental Delay, d2		0.5		5.7	1.1		1.9	3.6			2.7	
Delay (s)		8.3		16.5	10.5		20.7	24.6			26.6	
Level of Service		A		B	B		C	C			C	
Approach Delay (s)		8.3			12.9			24.1			26.6	
Approach LOS		A			B			C			C	

Intersection Summary					
HCM Average Control Delay	17.3	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	58.1%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Volume (veh/h)	113	212	209	31	61	150
Peak Hour Factor	0.85	0.78	0.90	0.88	1.00	0.93
Hourly flow rate (vph)	133	272	232	35	61	161
Pedestrians		37	65		330	
Lane Width (m)		3.0	3.0		4.8	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		3	5		37	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	597				1165	599
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	597				1165	599
tC, single (s)	4.1				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	78				44	48
cM capacity (veh/h)	614				109	310

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	133	272	232	35	222
Volume Left	133	0	0	0	61
Volume Right	0	0	0	35	161
cSH	614	1700	1700	1700	206
Volume to Capacity	0.22	0.16	0.14	0.02	1.08
Queue Length 95th (m)	6.2	0.0	0.0	0.0	77.6
Control Delay (s)	12.5	0.0	0.0	0.0	134.2
Lane LOS	B				F
Approach Delay (s)	4.1		0.0		134.2
Approach LOS					F

Intersection Summary			
Average Delay	35.2		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

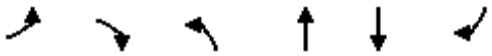
* User Entered Value



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	349	51	22	238	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	379	55	24	259	0	0
Pedestrians	300				200	
Lane Width (m)	3.0				0.0	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	21				0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			635		1214	607
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			598		1235	567
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			889		136	475

Direction, Lane #	EB 1	WB 1
Volume Total	435	283
Volume Left	0	24
Volume Right	55	0
cSH	1700	889
Volume to Capacity	0.26	0.03
Queue Length 95th (m)	0.0	0.6
Control Delay (s)	0.0	1.0
Lane LOS		A
Approach Delay (s)	0.0	1.0
Approach LOS		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	9	8	0	78	142	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	9	0	85	154	23
Pedestrians	24			5	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	2			0	1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	282	195	201			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	282	195	201			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	690	826	1343			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	85	177
Volume Left	10	0	0
Volume Right	9	0	23
cSH	748	1343	1700
Volume to Capacity	0.02	0.00	0.10
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	9.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	0	0	8	59	28	9	26	13	35	43	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	9	64	30	10	28	14	38	47	30
Pedestrians		75			31			31			28	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	358	306	168	255	314	94	152			73		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	358	306	168	255	314	94	152			73		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	89	97	99			97		
cM capacity (veh/h)	492	572	853	632	566	914	1429			1486		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	103	52	115
Volume Left	9	10	38
Volume Right	30	14	30
cSH	644	1429	1486
Volume to Capacity	0.16	0.01	0.03
Queue Length 95th (m)	4.3	0.2	0.6
Control Delay (s)	11.6	1.5	2.6
Lane LOS	B	A	A
Approach Delay (s)	11.6	1.5	2.6
Approach LOS	B		

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	30.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	10	42	10	6	63	17	7	15	3	9	15	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	46	11	7	68	18	8	16	3	10	16	22
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	191	166	117	190	175	62	87			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	191	166	117	190	175	62	87			55		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	93	99	99	90	98	99			99		
cM capacity (veh/h)	620	668	864	633	660	965	1446			1504		

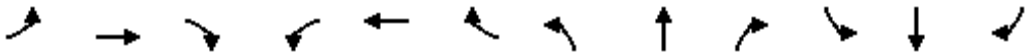
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	67	93	27	48
Volume Left	11	7	8	10
Volume Right	11	18	3	22
cSH	684	702	1446	1504
Volume to Capacity	0.10	0.13	0.01	0.01
Queue Length 95th (m)	2.5	3.5	0.1	0.1
Control Delay (s)	10.8	10.9	2.1	1.6
Lane LOS	B	B	A	A
Approach Delay (s)	10.8	10.9	2.1	1.6
Approach LOS	B	B		

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	4	83	0	6	0	0	0	41	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	4	90	0	7	0	0	0	45	34
Pedestrians		90			18			48			50	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	260	182	199	140	199	68	168			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	260	182	199	140	199	68	168			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	87	100	100			100		
cM capacity (veh/h)	588	697	807	771	683	938	1409			1574		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	95	7	78
Volume Left	4	7	0
Volume Right	0	0	34
cSH	686	1409	1700
Volume to Capacity	0.14	0.00	0.05
Queue Length 95th (m)	3.6	0.1	0.0
Control Delay (s)	11.1	7.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	7.6	0.0
Approach LOS	B		

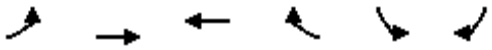
Intersection Summary				
Average Delay		6.1		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	23	9	15	19	13	29	15	210	30	107	306	36
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)	25	10	16	21	14	32	16	228	33	116	333	39
Pedestrians		85			165			17			83	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			14			1			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1069	1128	454	1065	1132	493	457			426		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1076	1142	394	1072	1146	493	396			426		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	92	97	80	89	93	98			88		
cM capacity (veh/h)	99	124	539	105	124	460	970			973		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	51	66	277	488
Volume Left	25	21	16	116
Volume Right	16	32	33	39
cSH	141	174	970	973
Volume to Capacity	0.36	0.38	0.02	0.12
Queue Length 95th (m)	11.4	12.5	0.4	3.1
Control Delay (s)	44.2	37.8	0.7	3.3
Lane LOS	E	E	A	A
Approach Delay (s)	44.2	37.8	0.7	3.3
Approach LOS	E	E		

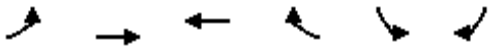
Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	36	343	225	8	11	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	373	245	9	12	22
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		166				
pX, platoon unblocked						
vC, conflicting volume	284				791	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284				791	393
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				96	96
cM capacity (veh/h)	1244				321	577

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	412	253	34
Volume Left	39	0	12
Volume Right	0	9	22
cSH	1244	1700	449
Volume to Capacity	0.03	0.15	0.07
Queue Length 95th (m)	0.7	0.0	1.8
Control Delay (s)	1.0	0.0	13.7
Lane LOS	A		B
Approach Delay (s)	1.0	0.0	13.7
Approach LOS			B

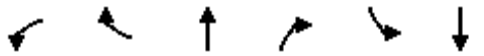
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	7	327	241	7	18	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	355	262	8	20	27
Pedestrians		100	100		50	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		9	9		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	320				786	416
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320				786	416
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	95
cM capacity (veh/h)	1187				314	557

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	363	270	47
Volume Left	8	0	20
Volume Right	0	8	27
cSH	1187	1700	421
Volume to Capacity	0.01	0.16	0.11
Queue Length 95th (m)	0.1	0.0	2.8
Control Delay (s)	0.2	0.0	14.6
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	14.6
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	3	10	62	8	18	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	67	9	20	217
Pedestrians	20		32			18
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		3			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	380	110			96	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	380	110			96	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	587	913			1472	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	76	237
Volume Left	3	0	20
Volume Right	11	9	0
cSH	809	1700	1472
Volume to Capacity	0.02	0.04	0.01
Queue Length 95th (m)	0.4	0.0	0.3
Control Delay (s)	9.5	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	0.7
Approach LOS	A		

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		32.7%	ICU Level of Service A
Analysis Period (min)		15	

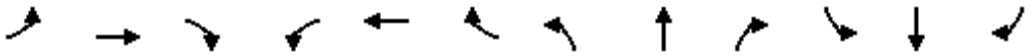
91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.2	0.1	0.2	0.3	0.8
Delay / Veh (s)	1.8	1.9	25.4	7.4	3.7
Stop Delay (hr)	0.1	0.0	0.2	0.3	0.6
St Del/Veh (s)	1.1	0.5	23.5	6.5	2.7
Total Stops	27	10	26	52	115
Travel Dist (km)	22.3	19.7	3.4	14.0	59.3
Travel Time (hr)	0.8	0.6	0.3	0.8	2.6
Avg Speed (kph)	29	32	13	17	24
Fuel Used (l)	41.8	29.9	5.4	24.3	101.4
HC Emissions (g)	4	6	0	1	11
CO Emissions (g)	1061	1212	68	319	2661
NOx Emissions (g)	13	16	1	3	32
Vehicles Entered	310	269	26	143	748
Vehicles Exited	311	269	26	144	750
Hourly Exit Rate	311	269	26	144	750
Input Volume	303	292	28	132	754
% of Volume	103	92	93	109	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

63: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.2	0.1	0.1	0.1	0.5
Delay / Veh (s)	2.0	2.3	8.9	7.1	2.7
Stop Delay (hr)	0.1	0.0	0.1	0.0	0.3
St Del/Veh (s)	0.6	1.5	7.3	6.4	1.5
Total Stops	17	15	31	16	79
Travel Dist (km)	50.3	11.4	4.6	1.8	68.1
Travel Time (hr)	1.6	0.4	0.2	0.1	2.4
Avg Speed (kph)	32	31	19	15	30
Fuel Used (l)	69.4	13.9	6.9	2.7	92.9
HC Emissions (g)	2	1	0	0	3
CO Emissions (g)	946	214	97	22	1279
NOx Emissions (g)	9	2	1	0	12
Vehicles Entered	428	115	43	26	612
Vehicles Exited	428	115	43	26	612
Hourly Exit Rate	428	115	43	26	612
Input Volume	416	116	47	24	604
% of Volume	103	99	91	106	101
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Scenario A 2020 PM with background traffic growth and development



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.92		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	0.97	1.00			0.97		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.96		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1493	1546			1432		1594	1606		1420	1415	
Flt Permitted	0.39	1.00			0.89		0.14	1.00		0.28	1.00	
Satd. Flow (perm)	605	1546			1280		240	1606		426	1415	
Volume (vph)	496	316	36	17	121	76	58	349	34	85	185	454
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	528	363	49	39	136	85	74	426	49	99	206	575
RTOR Reduction (vph)	0	7	0	0	24	0	0	6	0	0	139	0
Lane Group Flow (vph)	528	406	0	0	236	0	74	470	0	99	642	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	34.0	34.0			16.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)	36.0	36.0			18.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.50	0.50			0.25		0.39	0.39		0.39	0.39	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	475	773			320		93	625		166	550	
v/s Ratio Prot	c0.22	0.26						0.29			c0.45	
v/s Ratio Perm	c0.34				0.18		0.31			0.23		
v/c Ratio	1.11	0.52			0.74		0.80	0.75		0.60	1.17	
Uniform Delay, d1	16.5	12.2			24.8		19.5	19.0		17.5	22.0	
Progression Factor	1.00	1.00			1.19		1.00	1.00		0.85	0.71	
Incremental Delay, d2	75.4	2.5			14.1		49.1	8.1		13.8	92.2	
Delay (s)	91.9	14.7			43.6		68.6	27.1		28.7	107.9	
Level of Service	F	B			D		E	C		C	F	
Approach Delay (s)		58.1			43.6			32.7			99.0	
Approach LOS		E			D			C			F	

Intersection Summary			
HCM Average Control Delay	65.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	4%	
Volume (veh/h)	688	133	104	563	176	211
Peak Hour Factor	0.87	0.92	0.87	0.87	0.92	0.93
Hourly flow rate (vph)	791	145	120	647	191	227
Pedestrians	9			3	75	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			0	6	
Right turn flare (veh)						7
Median type					None	
Median storage veh)						
Upstream signal (m)	192			195		
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			1010		1510	941
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1011		1521	940
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			81		0	5
cM capacity (veh/h)			636		81	240

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	935	335	431	418
Volume Left	0	120	0	191
Volume Right	145	0	0	227
cSH	1700	636	1700	136
Volume to Capacity	0.55	0.19	0.25	3.09
Queue Length 95th (m)	0.0	5.2	0.0	Err
Control Delay (s)	0.0	5.9	0.0	Err
Lane LOS		A		F
Approach Delay (s)	0.0	2.6		Err
Approach LOS				F

Intersection Summary			
Average Delay	1973.1		
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	516	65	68	546	138	116
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	586	89	115	635	157	145
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			229		
pX, platoon unblocked			0.88		0.88	0.88
vC, conflicting volume			710		1217	669
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			672		1246	625
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		0	60
cM capacity (veh/h)			783		120	365

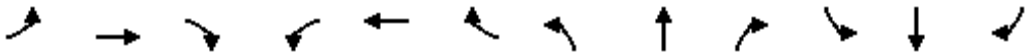
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	675	327	423	302
Volume Left	0	115	0	157
Volume Right	89	0	0	145
cSH	1700	783	1700	178
Volume to Capacity	0.40	0.15	0.25	1.70
Queue Length 95th (m)	0.0	3.9	0.0	159.1
Control Delay (s)	0.0	4.8	0.0	383.6
Lane LOS		A		F
Approach Delay (s)	0.0	2.1		383.6
Approach LOS				F

Intersection Summary			
Average Delay	67.9		
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	124	166	58	45	332	186	84	243	48	79	143	78
Peak Hour Factor	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Hourly flow rate (vph)	153	218	73	69	346	224	120	286	53	118	170	92

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	445	415	224	459	380
Volume Left (vph)	153	69	0	120	118
Volume Right (vph)	73	0	224	53	92
Hadj (s)	0.00	0.12	-0.67	0.02	-0.05
Departure Headway (s)	9.6	9.8	9.0	9.5	9.5
Degree Utilization, x	1.19	1.13	0.56	1.22	1.00
Capacity (veh/h)	378	380	389	382	380
Control Delay (s)	139.1	116.4	21.7	148.8	77.9
Approach Delay (s)	139.1	83.2		148.8	77.9
Approach LOS	F	F		F	F

Intersection Summary				
Delay	110.8			
HCM Level of Service	F			
Intersection Capacity Utilization	76.7%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1732	1498		1855	1355	1668	1799	
Flt Permitted		0.98			0.69	1.00		0.95	1.00	0.12	1.00	
Satd. Flow (perm)		1920			1216	1498		1770	1355	218	1799	
Volume (vph)	12	193	56	96	217	417	53	613	173	275	273	16
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	208	60	97	219	421	55	639	180	281	279	16
RTOR Reduction (vph)	0	12	0	0	0	229	0	0	99	0	3	0
Lane Group Flow (vph)	0	269	0	0	316	192	0	694	81	281	292	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.0			20.0	20.0		33.0	33.0	46.0	46.0	
Effective Green, g (s)		23.0			23.0	23.0		36.0	36.0	49.0	49.0	
Actuated g/C Ratio		0.29			0.29	0.29		0.45	0.45	0.61	0.61	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		552			350	431		797	610	297	1102	
v/s Ratio Prot										c0.11	0.16	
v/s Ratio Perm		0.14			c0.26	0.13		0.39	0.06	c0.47		
v/c Ratio		0.49			0.90	0.44		0.87	0.13	0.95	0.27	
Uniform Delay, d1		23.6			27.4	23.3		19.9	12.9	19.1	7.2	
Progression Factor		1.00			1.00	1.00		0.80	1.17	1.00	1.00	
Incremental Delay, d2		3.1			28.8	3.3		7.7	0.3	40.1	0.6	
Delay (s)		26.7			56.2	26.6		23.6	15.3	59.2	7.8	
Level of Service		C			E	C		C	B	E	A	
Approach Delay (s)		26.7			39.3			21.9			32.8	
Approach LOS		C			D			C			C	

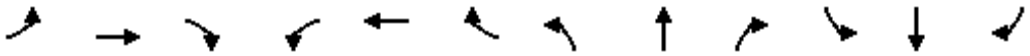
Intersection Summary			
HCM Average Control Delay	30.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.92			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1705	1710		1680	1892	1316		3050			3424	1386
Flt Permitted	0.31	1.00		0.30	1.00	1.00		0.77			0.60	1.00
Satd. Flow (perm)	558	1710		538	1892	1316		2382			2071	1386
Volume (vph)	86	257	97	87	439	75	124	478	167	64	235	51
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	112	317	143	102	453	95	170	525	226	107	264	60
RTOR Reduction (vph)	0	20	0	0	0	45	0	40	0	0	0	30
Lane Group Flow (vph)	112	440	0	102	453	50	0	882	0	0	371	30
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	223	684		215	757	526		1191			1036	693
v/s Ratio Prot		c0.26			0.24							
v/s Ratio Perm	0.20			0.19		0.04		c0.37			0.18	0.02
v/c Ratio	0.50	0.64		0.47	0.60	0.10		0.74			0.36	0.04
Uniform Delay, d1	18.0	19.4		17.8	18.9	15.0		15.9			12.2	10.2
Progression Factor	1.01	1.01		1.00	1.00	1.00		0.87			0.93	0.92
Incremental Delay, d2	7.9	4.6		7.3	3.5	0.4		3.7			0.9	0.1
Delay (s)	26.1	24.1		25.1	22.4	15.3		17.5			12.3	9.5
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		24.5			21.8			17.5			11.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

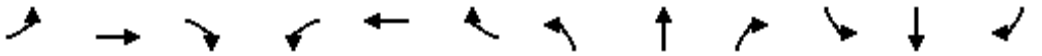
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	0	0	13	162	52	11	52	27	38	61	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	176	57	12	57	29	41	66	68
Pedestrians		45			51			36			74	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	542	389	182	365	408	196	180			137		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	542	389	182	365	408	196	180			137		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	64	93	99			97		
cM capacity (veh/h)	266	502	835	514	490	757	1396			1384		

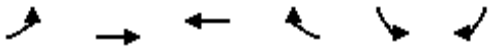
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	247	98	176
Volume Left	14	12	41
Volume Right	57	29	68
cSH	534	1396	1384
Volume to Capacity	0.46	0.01	0.03
Queue Length 95th (m)	18.3	0.2	0.7
Control Delay (s)	17.4	1.0	2.0
Lane LOS	C	A	A
Approach Delay (s)	17.4	1.0	2.0
Approach LOS	C		

Intersection Summary				
Average Delay	9.1			
Intersection Capacity Utilization	37.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.86		1.00	1.00	0.56
Flpb, ped/bikes	1.00	1.00	1.00		0.96	1.00	0.77	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1616	1448	354		1541	684	1332	1534		1723	1739	855
Flt Permitted	0.31	1.00	1.00		0.94	1.00	0.53	1.00		0.19	1.00	1.00
Satd. Flow (perm)	522	1448	354		1457	684	748	1534		346	1739	855
Volume (vph)	78	244	61	31	263	127	89	612	112	104	279	70
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	84	274	73	40	351	149	107	644	140	133	310	84
RTOR Reduction (vph)	0	0	49	0	0	21	0	4	0	0	0	0
Lane Group Flow (vph)	84	274	24	0	391	128	107	780	0	133	310	84
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	23.0	23.0	23.0		23.0	23.0	43.0	43.0		43.0	43.0	43.0
Effective Green, g (s)	26.0	26.0	26.0		26.0	26.0	46.0	46.0		46.0	46.0	46.0
Actuated g/C Ratio	0.32	0.32	0.32		0.32	0.32	0.58	0.58		0.58	0.58	0.58
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	170	471	115		474	222	430	882		199	1000	492
v/s Ratio Prot		0.19						c0.51			0.18	
v/s Ratio Perm	0.16		0.07		c0.27	0.19	0.14			0.38		0.10
v/c Ratio	0.49	0.58	0.21		0.82	0.58	0.25	0.88		0.67	0.31	0.17
Uniform Delay, d1	21.7	22.5	19.5		24.9	22.4	8.4	14.7		11.7	8.8	8.0
Progression Factor	0.98	0.94	1.24		0.78	0.74	1.12	1.23		0.82	0.75	0.73
Incremental Delay, d2	9.0	4.7	3.7		14.1	9.8	1.3	11.9		15.6	0.8	0.7
Delay (s)	30.2	25.7	27.9		33.7	26.3	10.7	30.0		25.2	7.3	6.6
Level of Service	C	C	C		C	C	B	C		C	A	A
Approach Delay (s)		27.0			31.6			27.7			11.7	
Approach LOS		C			C			C			B	

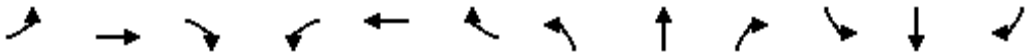
Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	18	358	526	8	26	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	389	572	9	28	46
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	664				1091	660
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664				1091	660
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				87	89
cM capacity (veh/h)	858				215	430

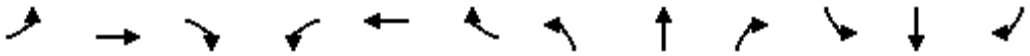
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	580	74
Volume Left	20	0	28
Volume Right	0	9	46
cSH	858	1700	311
Volume to Capacity	0.02	0.34	0.24
Queue Length 95th (m)	0.5	0.0	6.9
Control Delay (s)	0.7	0.0	20.2
Lane LOS	A		C
Approach Delay (s)	0.7	0.0	20.2
Approach LOS			C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.84		1.00	0.93			0.85			0.75	
Flpb, ped/bikes	0.71	1.00		0.67	1.00			0.94			0.95	
Frt	1.00	0.97		1.00	0.99			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1190	1247		1071	1473			1573			1432	
Flt Permitted	0.43	1.00		0.45	1.00			0.89			0.95	
Satd. Flow (perm)	535	1247		503	1473			1419			1363	
Volume (vph)	21	308	44	23	353	25	32	92	21	12	76	74
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	26	342	71	41	401	36	41	96	40	31	112	92
RTOR Reduction (vph)	0	9	0	0	4	0	0	13	0	0	8	0
Lane Group Flow (vph)	26	404	0	41	433	0	0	164	0	0	227	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.0	43.0		43.0	43.0			25.0			25.0	
Effective Green, g (s)	45.0	45.0		45.0	45.0			27.0			27.0	
Actuated g/C Ratio	0.56	0.56		0.56	0.56			0.34			0.34	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	301	701		283	829			479			460	
v/s Ratio Prot		c0.32			0.29							
v/s Ratio Perm	0.05			0.08				0.12			c0.17	
v/c Ratio	0.09	0.58		0.14	0.52			0.34			0.49	
Uniform Delay, d1	8.0	11.3		8.3	10.8			19.8			21.1	
Progression Factor	0.98	1.02		0.72	0.75			1.00			1.04	
Incremental Delay, d2	0.4	2.5		0.9	2.0			1.9			3.7	
Delay (s)	8.3	14.1		6.9	10.1			21.7			25.6	
Level of Service	A	B		A	B			C			C	
Approach Delay (s)		13.8			9.8			21.7			25.6	
Approach LOS		B			A			C			C	

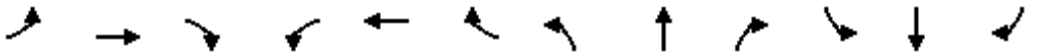
Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	16	54	7	12	171	28	17	24	20	26	22	43
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)	17	59	8	13	186	30	18	26	22	28	24	47
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	444	323	170	322	335	164	146			107		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	444	323	170	322	335	164	146			107		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	89	99	97	63	96	99			98		
cM capacity (veh/h)	284	511	784	464	503	787	1344			1409		

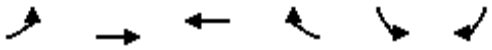
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	84	229	66	99
Volume Left	17	13	18	28
Volume Right	8	30	22	47
cSH	450	525	1344	1409
Volume to Capacity	0.19	0.44	0.01	0.02
Queue Length 95th (m)	5.1	16.7	0.3	0.5
Control Delay (s)	14.8	17.1	2.2	2.3
Lane LOS	B	C	A	A
Approach Delay (s)	14.8	17.1	2.2	2.3
Approach LOS	B	C		

Intersection Summary			
Average Delay	11.6		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.85		1.00	0.94		1.00	0.83			0.93	
Flpb, ped/bikes		0.97		0.62	1.00		0.71	1.00			1.00	
Frt		0.97		1.00	0.99		1.00	0.94			0.98	
Flt Protected		1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		2335		1042	1479		1161	1458			1714	
Flt Permitted		0.90		0.48	1.00		0.55	1.00			0.95	
Satd. Flow (perm)		2112		524	1479		669	1458			1624	
Volume (vph)	34	289	62	152	287	26	157	340	237	6	199	27
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	37	307	85	217	334	28	218	370	255	7	216	29
RTOR Reduction (vph)	0	27	0	0	4	0	0	24	0	0	6	0
Lane Group Flow (vph)	0	402	0	217	358	0	218	601	0	0	246	0
Confl. Peds. (#/hr)	435		420	420		435	271		340	340		271
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		37.0		37.0	37.0		31.0	31.0			31.0	
Effective Green, g (s)		39.0		39.0	39.0		33.0	33.0			33.0	
Actuated g/C Ratio		0.49		0.49	0.49		0.41	0.41			0.41	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1030		255	721		276	601			670	
v/s Ratio Prot					0.24			c0.41				
v/s Ratio Perm		0.19		c0.41			0.33				0.15	
v/c Ratio		0.39		0.85	0.50		0.79	1.00			0.37	
Uniform Delay, d1		13.0		18.0	13.9		20.5	23.5			16.3	
Progression Factor		0.89		1.00	1.00		1.00	1.00			1.03	
Incremental Delay, d2		1.0		28.3	2.4		20.2	36.7			1.5	
Delay (s)		12.5		46.3	16.3		40.7	60.2			18.3	
Level of Service		B		D	B		D	E			B	
Approach Delay (s)		12.5			27.5			55.1			18.3	
Approach LOS		B			C			E			B	

Intersection Summary			
HCM Average Control Delay	34.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Volume (veh/h)	201	354	361	165	30	129
Peak Hour Factor	0.94	0.91	0.85	0.96	0.92	0.92
Hourly flow rate (vph)	214	389	425	172	33	140
Pedestrians		16	33		435	
Lane Width (m)		3.0	3.0		4.8	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		1	2		48	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked					0.97	
vC, conflicting volume	1032				1709	876
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1032				1732	876
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	37				0	21
cM capacity (veh/h)	342				18	177

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	214	389	425	172	173
Volume Left	214	0	0	0	33
Volume Right	0	0	0	172	140
cSH	342	1700	1700	1700	66
Volume to Capacity	0.63	0.23	0.25	0.10	2.61
Queue Length 95th (m)	30.4	0.0	0.0	0.0	130.0
Control Delay (s)	31.6	0.0	0.0	0.0	861.0
Lane LOS	D				F
Approach Delay (s)	11.2		0.0		861.0
Approach LOS					F

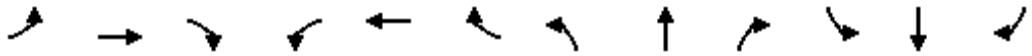
Intersection Summary			
Average Delay	113.4		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	424	87	38	397	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	461	95	41	432	0	0
Pedestrians	591				630	
Lane Width (m)	3.0				0.0	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	41				0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.86		0.93	0.86
vC, conflicting volume			1185		2243	1138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1216		2122	1161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		100	100
cM capacity (veh/h)			492		28	204

Direction, Lane #	EB 1	WB 1
Volume Total	555	473
Volume Left	0	41
Volume Right	95	0
cSH	1700	492
Volume to Capacity	0.33	0.08
Queue Length 95th (m)	0.0	2.1
Control Delay (s)	0.0	2.5
Lane LOS		A
Approach Delay (s)	0.0	2.5
Approach LOS		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	16	217	0	52	0	0	0	31	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	17	236	0	57	0	0	0	34	87
Pedestrians		28			32			60			84	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	420	250	165	282	294	116	149			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	420	250	165	282	294	116	149			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	59	100	96			100		
cM capacity (veh/h)	328	610	834	587	577	845	1433			1537		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	253	57	121
Volume Left	17	57	0
Volume Right	0	0	87
cSH	577	1433	1700
Volume to Capacity	0.44	0.04	0.07
Queue Length 95th (m)	16.9	0.9	0.0
Control Delay (s)	16.0	7.6	0.0
Lane LOS	C	A	
Approach Delay (s)	16.0	7.6	0.0
Approach LOS	C		

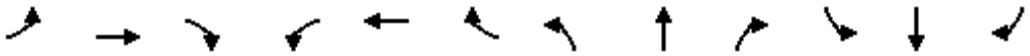
Intersection Summary				
Average Delay	10.4			
Intersection Capacity Utilization	32.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	60	344	536	0	0	284
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	374	583	0	0	309
Pedestrians	52		163			169
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	1106	804			635	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1105	763			558	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	59	0			100	
cM capacity (veh/h)	160	274			801	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	65	374	583	309
Volume Left	65	0	0	0
Volume Right	0	374	0	0
cSH	160	274	1700	1700
Volume to Capacity	0.41	1.37	0.34	0.18
Queue Length 95th (m)	13.6	149.5	0.0	0.0
Control Delay (s)	42.2	222.9	0.0	0.0
Lane LOS	E	F		
Approach Delay (s)	196.0		0.0	0.0
Approach LOS	F			

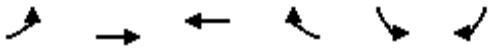
Intersection Summary			
Average Delay	64.7		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	33	54	20	40	74	175	54	432	87	134	192	83
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)	36	59	22	43	80	190	59	470	95	146	209	90
Pedestrians		94			157			19			78	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			13			2			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	1582	1478	367	1406	1475	752	393			721		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1608	1500	338	1425	1497	752	365			721		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	17	96	0	0	43	94			81		
cM capacity (veh/h)	0	71	609	20	71	331	1049			762		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	116	314	623	445
Volume Left	36	43	59	146
Volume Right	22	190	95	90
cSH	0	82	1049	762
Volume to Capacity	Err	3.84	0.06	0.19
Queue Length 95th (m)	Err	Err	1.3	5.3
Control Delay (s)	Err	Err	1.5	5.2
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	1.5	5.2
Approach LOS	F	F		

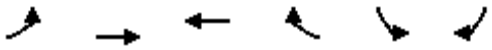
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	6	345	491	8	23	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	375	534	9	25	38
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		168				
pX, platoon unblocked						
vC, conflicting volume	573				1017	682
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	573				1017	682
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				90	90
cM capacity (veh/h)	973				241	395

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	382	542	63
Volume Left	7	0	25
Volume Right	0	9	38
cSH	973	1700	316
Volume to Capacity	0.01	0.32	0.20
Queue Length 95th (m)	0.2	0.0	5.6
Control Delay (s)	0.2	0.0	19.2
Lane LOS	A		C
Approach Delay (s)	0.2	0.0	19.2
Approach LOS			C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	42	293	475	16	9	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	318	516	17	10	42
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	583				1083	707
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583				1083	707
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				95	89
cM capacity (veh/h)	950				201	370

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	364	534	52
Volume Left	46	0	10
Volume Right	0	17	42
cSH	950	1700	319
Volume to Capacity	0.05	0.31	0.16
Queue Length 95th (m)	1.1	0.0	4.4
Control Delay (s)	1.6	0.0	18.5
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	18.5
Approach LOS			C

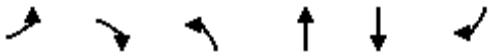
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	27	24	136	29	38	206
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	26	148	32	41	224
Pedestrians	102		74			46
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	9		6			4
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	646	312			281	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	646	312			281	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			96	
cM capacity (veh/h)	360	639			1169	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	55	179	265
Volume Left	29	0	41
Volume Right	26	32	0
cSH	453	1700	1169
Volume to Capacity	0.12	0.11	0.04
Queue Length 95th (m)	3.2	0.0	0.8
Control Delay (s)	14.1	0.0	1.6
Lane LOS	B		A
Approach Delay (s)	14.1	0.0	1.6
Approach LOS	B		

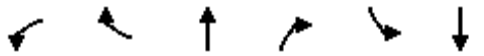
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	85	19	4	290	140	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	21	4	315	152	70
Pedestrians	95			14	26	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	8			1	2	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	632	296	317			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	632	296	317			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	97	100			
cM capacity (veh/h)	398	675	1142			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	113	320	222
Volume Left	92	4	0
Volume Right	21	0	70
cSH	430	1142	1700
Volume to Capacity	0.26	0.00	0.13
Queue Length 95th (m)	7.9	0.1	0.0
Control Delay (s)	16.3	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	16.3	0.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	30	28	299	84	38	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	30	325	91	41	218
Pedestrians	75		75			81
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		6			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			59			
pX, platoon unblocked						
vC, conflicting volume	822	527			491	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	822	527			491	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	94			96	
cM capacity (veh/h)	289	480			1003	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	63	416	260
Volume Left	33	0	41
Volume Right	30	91	0
cSH	357	1700	1003
Volume to Capacity	0.18	0.24	0.04
Queue Length 95th (m)	4.8	0.0	1.0
Control Delay (s)	17.2	0.0	1.7
Lane LOS	C		A
Approach Delay (s)	17.2	0.0	1.7
Approach LOS	C		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

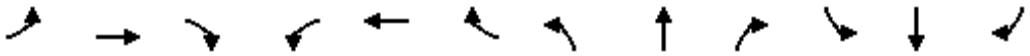
91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.4	0.4	1.1	1.0	3.0
Delay / Veh (s)	4.1	3.1	38.8	32.0	10.2
Stop Delay (hr)	0.3	0.1	1.1	1.0	2.5
St Del/Veh (s)	2.8	1.1	37.3	31.1	8.6
Total Stops	75	52	102	64	293
Travel Dist (km)	27.8	33.3	13.3	12.1	86.6
Travel Time (hr)	1.3	1.2	1.5	1.5	5.5
Avg Speed (kph)	22	27	9	8	16
Fuel Used (l)	48.7	49.9	25.2	25.5	149.3
HC Emissions (g)	8	4	0	1	14
CO Emissions (g)	1643	1030	230	301	3204
NOx Emissions (g)	22	13	2	3	40
Vehicles Entered	387	437	101	118	1043
Vehicles Exited	388	436	102	117	1043
Hourly Exit Rate	388	436	102	117	1043
Input Volume	378	471	98	114	1061
% of Volume	103	93	104	102	98
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

174: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.2	0.1	0.8	0.2	1.3
Delay / Veh (s)	2.0	1.9	18.7	8.8	5.5
Stop Delay (hr)	0.1	0.1	0.7	0.1	1.0
St Del/Veh (s)	0.8	0.7	17.2	8.3	4.3
Total Stops	29	21	146	46	242
Travel Dist (km)	43.0	25.8	13.1	4.1	86.0
Travel Time (hr)	1.4	0.7	1.2	0.3	3.6
Avg Speed (kph)	32	36	11	13	24
Fuel Used (l)	61.4	25.2	21.6	6.6	114.8
HC Emissions (g)	2	1	0	0	4
CO Emissions (g)	893	313	167	73	1447
NOx Emissions (g)	9	3	2	1	15
Vehicles Entered	368	255	148	64	835
Vehicles Exited	370	255	148	64	837
Hourly Exit Rate	370	255	148	64	837
Input Volume	365	336	154	63	918
% of Volume	101	76	96	101	91
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Scenario B 2020 AM with background traffic growth and development



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.90	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1462	1608			1517		1626	1625		1472	1497	
Flt Permitted	0.61	1.00			0.89		0.11	1.00		0.58	1.00	
Satd. Flow (perm)	933	1608			1362		190	1625		901	1497	
Volume (vph)	262	347	37	7	36	34	9	165	25	224	281	508
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	288	369	53	18	42	41	18	206	36	238	339	591
RTOR Reduction (vph)	0	7	0	0	31	0	0	9	0	0	87	0
Lane Group Flow (vph)	288	415	0	0	70	0	18	234	0	238	843	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.0	26.0			16.0		34.0	34.0		34.0	34.0	
Effective Green, g (s)	28.0	28.0			18.0		36.0	36.0		36.0	36.0	
Actuated g/C Ratio	0.39	0.39			0.25		0.50	0.50		0.50	0.50	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	407	625			341		95	813		451	749	
v/s Ratio Prot	0.06	c0.26						0.14			c0.56	
v/s Ratio Perm	c0.22				0.05		0.09			0.26		
v/c Ratio	0.71	0.66			0.21		0.19	0.29		0.53	1.13	
Uniform Delay, d1	19.4	18.1			21.3		9.9	10.5		12.2	18.0	
Progression Factor	1.00	1.00			1.43		1.05	1.06		0.91	0.72	
Incremental Delay, d2	10.0	5.5			1.4		4.4	0.9		3.4	69.9	
Delay (s)	29.3	23.6			31.9		14.8	12.0		14.5	83.0	
Level of Service	C	C			C		B	B		B	F	
Approach Delay (s)		25.9			31.9			12.2			69.0	
Approach LOS		C			C			B			E	

Intersection Summary			
HCM Average Control Delay	47.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	4%	
Volume (veh/h)	542	199	162	414	49	109
Peak Hour Factor	0.91	0.82	0.87	0.82	0.85	0.88
Hourly flow rate (vph)	596	243	186	505	58	124
Pedestrians	4			5	44	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	4	
Right turn flare (veh)						7
Median type					None	
Median storage veh)						
Upstream signal (m)	192			195		
pX, platoon unblocked			0.87		0.87	0.87
vC, conflicting volume			882		1390	766
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			865		1446	732
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			71		22	60
cM capacity (veh/h)			650		74	308

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	838	354	337	182
Volume Left	0	186	0	58
Volume Right	243	0	0	124
cSH	1700	650	1700	234
Volume to Capacity	0.49	0.29	0.20	0.78
Queue Length 95th (m)	0.0	9.0	0.0	42.5
Control Delay (s)	0.0	8.6	0.0	61.8
Lane LOS		A		F
Approach Delay (s)	0.0	4.4		61.8
Approach LOS				F

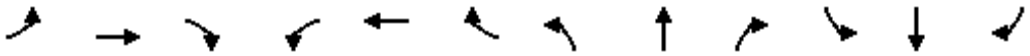
Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	848	170	121	396	37	30
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	874	175	138	450	45	36
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			229		
pX, platoon unblocked			0.72		0.72	0.72
vC, conflicting volume			1084		1499	1005
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1117		1690	1007
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			68		0	78
cM capacity (veh/h)			435		40	166

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1049	288	300	81
Volume Left	0	138	0	45
Volume Right	175	0	0	36
cSH	1700	435	1700	61
Volume to Capacity	0.62	0.32	0.18	1.33
Queue Length 95th (m)	0.0	10.2	0.0	52.4
Control Delay (s)	0.0	11.2	0.0	340.3
Lane LOS		B		F
Approach Delay (s)	0.0	5.5		340.3
Approach LOS				F

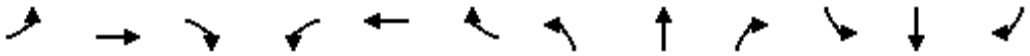
Intersection Summary			
Average Delay	17.9		
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	76	222	50	44	141	47	36	141	54	150	180	34
Peak Hour Factor	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Hourly flow rate (vph)	78	229	52	47	150	50	40	158	61	158	189	36

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	359	197	50	260	383
Volume Left (vph)	78	47	0	40	158
Volume Right (vph)	52	0	50	61	36
Hadj (s)	-0.01	0.15	-0.67	-0.08	0.06
Departure Headway (s)	7.0	7.9	7.0	7.1	6.8
Degree Utilization, x	0.70	0.43	0.10	0.51	0.73
Capacity (veh/h)	485	406	449	458	495
Control Delay (s)	24.4	15.4	9.6	17.1	25.9
Approach Delay (s)	24.4	14.3		17.1	25.9
Approach LOS	C	B		C	D

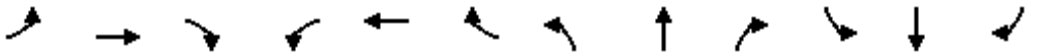
Intersection Summary				
Delay	21.3			
HCM Level of Service	C			
Intersection Capacity Utilization	81.0%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2001			1715	1502		1857	1350	1639	1812	
Flt Permitted		0.98			0.64	1.00		0.96	1.00	0.34	1.00	
Satd. Flow (perm)		1967			1119	1502		1790	1350	587	1812	
Volume (vph)	11	218	39	109	166	140	17	257	115	488	351	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	237	42	115	175	147	19	286	128	530	382	7
RTOR Reduction (vph)	0	8	0	0	0	101	0	0	90	0	1	0
Lane Group Flow (vph)	0	283	0	0	290	46	0	305	38	530	388	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		21.0	21.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		24.0	24.0	47.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.30	0.30	0.59	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		615			350	469		537	405	595	1065	
v/s Ratio Prot										c0.21	0.21	
v/s Ratio Perm		0.14			c0.26	0.03		0.17	0.03	c0.31		
v/c Ratio		0.46			0.83	0.10		0.57	0.09	0.89	0.36	
Uniform Delay, d1		22.1			25.5	19.5		23.6	20.2	11.8	8.7	
Progression Factor		1.00			1.00	1.00		0.93	1.37	1.00	1.00	
Incremental Delay, d2		2.5			19.8	0.4		3.5	0.4	18.0	1.0	
Delay (s)		24.6			45.3	19.9		25.4	27.9	29.9	9.6	
Level of Service		C			D	B		C	C	C	A	
Approach Delay (s)		24.6			36.8			26.2			21.3	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

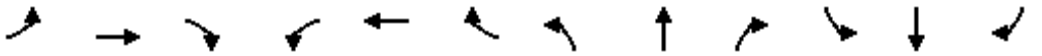
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1592	1659		1681	1874	1369		3215			3486	1527
Flt Permitted	0.57	1.00		0.30	1.00	1.00		0.66			0.66	1.00
Satd. Flow (perm)	958	1659		538	1874	1369		2156			2338	1527
Volume (vph)	40	212	188	58	186	35	97	316	105	106	373	44
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	252	219	66	221	49	156	395	114	129	455	81
RTOR Reduction (vph)	0	39	0	0	0	29	0	22	0	0	0	42
Lane Group Flow (vph)	49	432	0	66	221	20	0	643	0	0	584	39
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	395	684		222	773	565		1051			1140	744
v/s Ratio Prot		c0.26			0.12							
v/s Ratio Perm	0.05			0.12		0.01		c0.30			0.25	0.03
v/c Ratio	0.12	0.63		0.30	0.29	0.04		0.61			0.51	0.05
Uniform Delay, d1	14.6	18.7		15.7	15.7	14.0		15.0			14.0	10.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.64			0.86	0.63
Incremental Delay, d2	0.6	4.4		3.4	0.9	0.1		2.4			1.5	0.1
Delay (s)	15.2	23.1		19.1	16.6	14.1		12.0			13.6	6.9
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		22.4			16.7			12.0			12.8	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.89		1.00	1.00	0.68
Flpb, ped/bikes	0.76	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1220	1564	545		1318	802	1658	1571		1790	1773	1021
Flt Permitted	0.53	1.00	1.00		0.91	1.00	0.38	1.00		0.30	1.00	1.00
Satd. Flow (perm)	683	1564	545		1216	802	667	1571		569	1773	1021
Volume (vph)	79	206	97	35	181	75	46	408	72	81	396	49
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	130	245	117	41	201	90	63	469	104	121	471	53
RTOR Reduction (vph)	0	0	73	0	0	56	0	10	0	0	0	17
Lane Group Flow (vph)	130	245	44	0	242	34	63	563	0	121	471	36
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	27.0	27.0	27.0		27.0	27.0	39.0	39.0		39.0	39.0	39.0
Effective Green, g (s)	30.0	30.0	30.0		30.0	30.0	42.0	42.0		42.0	42.0	42.0
Actuated g/C Ratio	0.38	0.38	0.38		0.38	0.38	0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	256	587	204		456	301	350	825		299	931	536
v/s Ratio Prot		0.16						c0.36			0.27	
v/s Ratio Perm	0.19		0.08		c0.20	0.04	0.09			0.21		0.04
v/c Ratio	0.51	0.42	0.22		0.53	0.11	0.18	0.68		0.40	0.51	0.07
Uniform Delay, d1	19.3	18.5	17.0		19.5	16.3	10.0	14.1		11.5	12.3	9.4
Progression Factor	1.00	1.00	1.00		0.76	0.47	1.11	1.28		0.76	0.77	0.61
Incremental Delay, d2	7.0	2.2	2.4		4.2	0.7	1.1	4.3		3.8	1.8	0.2
Delay (s)	26.3	20.7	19.4		19.2	8.4	12.1	22.3		12.5	11.3	5.9
Level of Service	C	C	B		B	A	B	C		B	B	A
Approach Delay (s)		21.9			16.2			21.3			11.1	
Approach LOS		C			B			C			B	

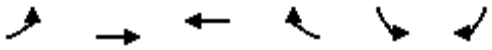
Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	34	92	425	0	0	488
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	100	462	0	0	530
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.92	0.87			0.87	
vC, conflicting volume	1198	619			534	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1008	563			466	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	75			100	
cM capacity (veh/h)	204	399			897	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	37	100	462	530
Volume Left	37	0	0	0
Volume Right	0	100	0	0
cSH	204	399	1700	1700
Volume to Capacity	0.18	0.25	0.27	0.31
Queue Length 95th (m)	4.9	7.4	0.0	0.0
Control Delay (s)	26.5	17.0	0.0	0.0
Lane LOS	D	C		
Approach Delay (s)	19.6		0.0	0.0
Approach LOS	C			

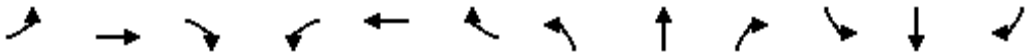
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	9	363	247	5	20	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	395	268	5	22	13
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	358				772	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	358				772	355
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	1114				337	639

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	404	274	35
Volume Left	10	0	22
Volume Right	0	5	13
cSH	1114	1700	410
Volume to Capacity	0.01	0.16	0.08
Queue Length 95th (m)	0.2	0.0	2.1
Control Delay (s)	0.3	0.0	14.6
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	14.6
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.90			0.93			0.88			0.81	
Flpb, ped/bikes		1.00			1.00			0.94			0.93	
Frt		0.98			0.99			0.97			0.95	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		1415			1280			1665			1531	
Flt Permitted		1.00			1.00			0.91			0.95	
Satd. Flow (perm)		1415			1280			1535			1472	
Volume (vph)	0	289	47	0	207	20	7	31	12	25	84	57
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	0	344	64	0	241	27	18	36	16	33	109	79
RTOR Reduction (vph)	0	8	0	0	5	0	0	10	0	0	25	0
Lane Group Flow (vph)	0	400	0	0	263	0	0	60	0	0	196	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		41.0			41.0			27.0			27.0	
Effective Green, g (s)		43.0			43.0			29.0			29.0	
Actuated g/C Ratio		0.54			0.54			0.36			0.36	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		761			688			556			534	
v/s Ratio Prot		c0.28			0.21							
v/s Ratio Perm								0.04			c0.13	
v/c Ratio		0.53			0.38			0.11			0.37	
Uniform Delay, d1		11.9			10.8			16.9			18.8	
Progression Factor		0.75			0.72			0.95			0.97	
Incremental Delay, d2		2.4			1.6			0.4			1.9	
Delay (s)		11.4			9.3			16.4			20.2	
Level of Service		B			A			B			C	
Approach Delay (s)		11.4			9.3			16.4			20.2	
Approach LOS		B			A			B			C	

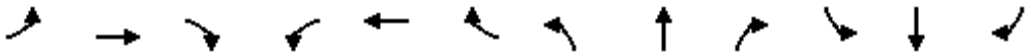
Intersection Summary			
HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	46	17	113	16	17	288
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	18	123	17	18	313
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			61			
pX, platoon unblocked						
vC, conflicting volume	527	178			161	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	527	178			161	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	98			99	
cM capacity (veh/h)	486	832			1392	

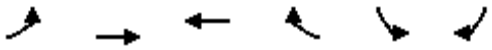
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	140	332
Volume Left	50	0	18
Volume Right	18	17	0
cSH	547	1700	1392
Volume to Capacity	0.13	0.08	0.01
Queue Length 95th (m)	3.2	0.0	0.3
Control Delay (s)	12.5	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	12.5	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.87		1.00	0.98		1.00	0.82			0.96	
Flpb, ped/bikes	0.60	1.00		0.75	1.00		1.00	1.00			0.99	
Frt	1.00	0.97		1.00	0.99		1.00	0.92			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1014	1335		1234	1400		1503	1408			2008	
Flt Permitted	0.57	1.00		0.48	1.00		0.42	1.00			0.97	
Satd. Flow (perm)	611	1335		629	1400		661	1408			1949	
Volume (vph)	32	226	64	154	227	7	36	112	125	12	252	25
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	53	282	83	195	252	9	43	126	164	22	286	31
RTOR Reduction (vph)	0	13	0	0	2	0	0	58	0	0	5	0
Lane Group Flow (vph)	53	352	0	195	259	0	43	232	0	0	334	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.0	43.0		43.0	43.0		25.0	25.0			25.0	
Effective Green, g (s)	45.0	45.0		45.0	45.0		27.0	27.0			27.0	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.34	0.34			0.34	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	344	751		354	788		223	475			658	
v/s Ratio Prot		0.26			0.19			0.16				
v/s Ratio Perm	0.09			c0.31			0.07				c0.17	
v/c Ratio	0.15	0.47		0.55	0.33		0.19	0.49			0.51	
Uniform Delay, d1	8.4	10.4		11.1	9.4		18.8	21.0			21.2	
Progression Factor	0.97	0.81		1.00	1.00		1.00	1.00			1.13	
Incremental Delay, d2	0.9	2.0		6.1	1.1		1.9	3.6			2.7	
Delay (s)	9.0	10.4		17.1	10.5		20.7	24.6			26.7	
Level of Service	A	B		B	B		C	C			C	
Approach Delay (s)		10.2			13.3			24.1			26.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Volume (veh/h)	113	212	209	31	61	150
Peak Hour Factor	0.85	0.78	0.90	0.88	1.00	0.93
Hourly flow rate (vph)	133	272	232	35	61	161
Pedestrians		37	65		330	
Lane Width (m)		3.0	3.0		4.8	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		3	5		37	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	597				1165	599
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	597				1165	599
tC, single (s)	4.1				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	78				44	48
cM capacity (veh/h)	614				109	310

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	133	272	232	35	222
Volume Left	133	0	0	0	61
Volume Right	0	0	0	35	161
cSH	614	1700	1700	1700	206
Volume to Capacity	0.22	0.16	0.14	0.02	1.08
Queue Length 95th (m)	6.2	0.0	0.0	0.0	77.6
Control Delay (s)	12.5	0.0	0.0	0.0	134.2
Lane LOS	B				F
Approach Delay (s)	4.1		0.0		134.2
Approach LOS					F

Intersection Summary			
Average Delay	35.2		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

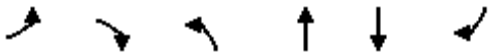
* User Entered Value



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	349	50	22	238	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	379	54	24	259	0	0
Pedestrians	300				200	
Lane Width (m)	3.0				0.0	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	21				0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			634		1213	607
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			597		1235	567
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			890		136	475

Direction, Lane #	EB 1	WB 1
Volume Total	434	283
Volume Left	0	24
Volume Right	54	0
cSH	1700	890
Volume to Capacity	0.26	0.03
Queue Length 95th (m)	0.0	0.6
Control Delay (s)	0.0	1.0
Lane LOS		A
Approach Delay (s)	0.0	1.0
Approach LOS		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	9	8	0	78	142	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	9	0	85	154	23
Pedestrians	24			5	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	2			0	1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	282	195	201			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	282	195	201			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	690	826	1343			

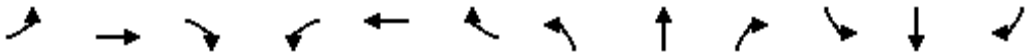
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	85	177
Volume Left	10	0	0
Volume Right	9	0	23
cSH	748	1343	1700
Volume to Capacity	0.02	0.00	0.10
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	9.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	0	0	8	59	42	9	26	13	35	43	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	9	64	46	10	28	14	38	47	30
Pedestrians		75			31			31			28	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	374	306	168	255	314	94	152			73		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	374	306	168	255	314	94	152			73		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	89	95	99			97		
cM capacity (veh/h)	473	572	853	632	566	914	1429			1486		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	118	52	115
Volume Left	9	10	38
Volume Right	46	14	30
cSH	670	1429	1486
Volume to Capacity	0.18	0.01	0.03
Queue Length 95th (m)	4.9	0.2	0.6
Control Delay (s)	11.5	1.5	2.6
Lane LOS	B	A	A
Approach Delay (s)	11.5	1.5	2.6
Approach LOS	B		

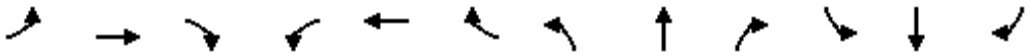
Intersection Summary				
Average Delay	6.1			
Intersection Capacity Utilization	30.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	10	42	10	6	77	17	7	15	3	9	15	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	46	11	7	84	18	8	16	3	10	16	22
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	198	166	117	190	175	62	87			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	198	166	117	190	175	62	87			55		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	93	99	99	87	98	99			99		
cM capacity (veh/h)	601	668	864	633	660	965	1446			1504		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	67	109	27	48
Volume Left	11	7	8	10
Volume Right	11	18	3	22
cSH	681	696	1446	1504
Volume to Capacity	0.10	0.16	0.01	0.01
Queue Length 95th (m)	2.5	4.2	0.1	0.1
Control Delay (s)	10.9	11.1	2.1	1.6
Lane LOS	B	B	A	A
Approach Delay (s)	10.9	11.1	2.1	1.6
Approach LOS	B	B		

Intersection Summary				
Average Delay	8.3			
Intersection Capacity Utilization	30.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	4	83	0	6	0	0	0	41	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	4	90	0	7	0	0	0	45	34
Pedestrians		90			18			48			50	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	260	182	199	140	199	68	168			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	260	182	199	140	199	68	168			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	87	100	100			100		
cM capacity (veh/h)	588	697	807	771	683	938	1409			1574		

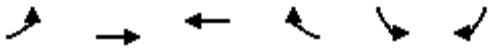
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	95	7	78
Volume Left	4	7	0
Volume Right	0	0	34
cSH	686	1409	1700
Volume to Capacity	0.14	0.00	0.05
Queue Length 95th (m)	3.6	0.1	0.0
Control Delay (s)	11.1	7.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	7.6	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		6.1		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	23	9	15	19	13	29	15	210	30	107	306	49
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)	25	10	16	21	14	32	16	228	33	116	333	53
Pedestrians		85			165			17			83	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			14			1			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1076	1135	461	1072	1146	493	471			426		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1084	1150	402	1080	1162	493	412			426		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	74	92	97	80	88	93	98			88		
cM capacity (veh/h)	98	123	534	103	121	460	957			973		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	51	66	277	502
Volume Left	25	21	16	116
Volume Right	16	32	33	53
cSH	140	172	957	973
Volume to Capacity	0.37	0.39	0.02	0.12
Queue Length 95th (m)	11.6	12.7	0.4	3.1
Control Delay (s)	45.0	38.4	0.7	3.2
Lane LOS	E	E	A	A
Approach Delay (s)	45.0	38.4	0.7	3.2
Approach LOS	E	E		

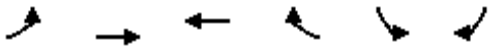
Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	36	343	225	8	11	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	373	245	9	12	22
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		166				
pX, platoon unblocked						
vC, conflicting volume	284				791	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284				791	393
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				96	96
cM capacity (veh/h)	1244				321	577

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	412	253	34
Volume Left	39	0	12
Volume Right	0	9	22
cSH	1244	1700	449
Volume to Capacity	0.03	0.15	0.07
Queue Length 95th (m)	0.7	0.0	1.8
Control Delay (s)	1.0	0.0	13.7
Lane LOS	A		B
Approach Delay (s)	1.0	0.0	13.7
Approach LOS			B

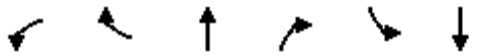
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	7	327	241	7	18	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	355	262	8	20	27
Pedestrians		100	100		50	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		9	9		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	320				786	416
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320				786	416
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	95
cM capacity (veh/h)	1187				314	557

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	363	270	47
Volume Left	8	0	20
Volume Right	0	8	27
cSH	1187	1700	421
Volume to Capacity	0.01	0.16	0.11
Queue Length 95th (m)	0.1	0.0	2.8
Control Delay (s)	0.2	0.0	14.6
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	14.6
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	3	10	43	8	18	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	11	47	9	20	217
Pedestrians	20		32			18
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		3			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	360	89			75	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	360	89			75	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	603	938			1498	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	14	55	237
Volume Left	3	0	20
Volume Right	11	9	0
cSH	831	1700	1498
Volume to Capacity	0.02	0.03	0.01
Queue Length 95th (m)	0.4	0.0	0.3
Control Delay (s)	9.4	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	0.7
Approach LOS	A		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

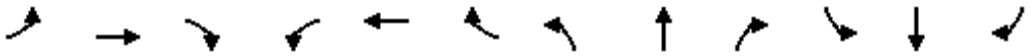
63: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.2	0.1	0.1	0.1	0.5
Delay / Veh (s)	1.8	1.4	10.7	11.5	2.7
Stop Delay (hr)	0.1	0.0	0.1	0.1	0.3
St Del/Veh (s)	0.6	0.7	9.3	11.0	1.6
Total Stops	15	14	30	23	82
Travel Dist (km)	50.1	13.6	4.6	1.6	69.8
Travel Time (hr)	1.6	0.4	0.3	0.1	2.4
Avg Speed (kph)	32	35	17	12	30
Fuel Used (l)	69.7	16.3	7.1	2.6	95.7
HC Emissions (g)	3	1	0	0	4
CO Emissions (g)	999	255	141	19	1414
NOx Emissions (g)	10	2	1	0	14
Vehicles Entered	426	136	42	23	627
Vehicles Exited	425	135	43	23	626
Hourly Exit Rate	425	135	43	23	626
Input Volume	416	136	47	24	623
% of Volume	102	99	91	94	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.2	0.1	0.1	0.3	0.7
Delay / Veh (s)	2.2	2.0	17.4	7.0	3.5
Stop Delay (hr)	0.1	0.0	0.1	0.2	0.5
St Del/Veh (s)	1.3	0.6	15.6	6.1	2.4
Total Stops	40	9	24	48	121
Travel Dist (km)	23.6	16.3	3.3	12.9	56.2
Travel Time (hr)	0.9	0.5	0.2	0.7	2.4
Avg Speed (kph)	26	31	17	17	24
Fuel Used (l)	42.5	24.3	4.8	22.5	94.2
HC Emissions (g)	4	4	0	1	10
CO Emissions (g)	1058	896	93	298	2345
NOx Emissions (g)	13	12	1	3	28
Vehicles Entered	330	227	24	131	712
Vehicles Exited	330	227	24	131	712
Hourly Exit Rate	330	227	24	131	712
Input Volume	322	290	28	132	772
% of Volume	102	78	86	99	92
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Scenario B 2020 PM with background traffic growth and development



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.92		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	0.97	1.00			0.97		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.96		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1493	1546			1432		1594	1606		1420	1415	
Flt Permitted	0.39	1.00			0.89		0.14	1.00		0.28	1.00	
Satd. Flow (perm)	605	1546			1280		240	1606		426	1415	
Volume (vph)	496	316	36	17	121	76	58	349	34	85	185	454
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	528	363	49	39	136	85	74	426	49	99	206	575
RTOR Reduction (vph)	0	7	0	0	24	0	0	6	0	0	139	0
Lane Group Flow (vph)	528	406	0	0	236	0	74	470	0	99	642	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	34.0	34.0			16.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)	36.0	36.0			18.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.50	0.50			0.25		0.39	0.39		0.39	0.39	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	475	773			320		93	625		166	550	
v/s Ratio Prot	c0.22	0.26						0.29			c0.45	
v/s Ratio Perm	c0.34				0.18		0.31			0.23		
v/c Ratio	1.11	0.52			0.74		0.80	0.75		0.60	1.17	
Uniform Delay, d1	16.5	12.2			24.8		19.5	19.0		17.5	22.0	
Progression Factor	1.00	1.00			1.19		1.00	1.00		0.85	0.71	
Incremental Delay, d2	75.4	2.5			14.1		49.1	8.1		13.8	92.2	
Delay (s)	91.9	14.7			43.6		68.6	27.1		28.7	107.9	
Level of Service	F	B			D		E	C		C	F	
Approach Delay (s)		58.1			43.6			32.7			99.0	
Approach LOS		E			D			C			F	

Intersection Summary			
HCM Average Control Delay	65.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	4%	
Volume (veh/h)	666	133	104	563	176	232
Peak Hour Factor	0.87	0.92	0.87	0.87	0.92	0.93
Hourly flow rate (vph)	766	145	120	647	191	249
Pedestrians	9			3	75	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			0	6	
Right turn flare (veh)						7
Median type					None	
Median storage veh)						
Upstream signal (m)	192			195		
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			985		1484	916
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			985		1495	914
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		0	0
cM capacity (veh/h)			650		85	250

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	910	335	431	441
Volume Left	0	120	0	191
Volume Right	145	0	0	249
cSH	1700	650	1700	147
Volume to Capacity	0.54	0.18	0.25	3.00
Queue Length 95th (m)	0.0	5.1	0.0	Err
Control Delay (s)	0.0	5.8	0.0	Err
Lane LOS		A		F
Approach Delay (s)	0.0	2.5		Err
Approach LOS				F

Intersection Summary			
Average Delay	2082.2		
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	516	65	68	546	138	94
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	586	89	115	635	157	118
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			229		
pX, platoon unblocked			0.88		0.88	0.88
vC, conflicting volume			710		1217	669
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			672		1246	625
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		0	68
cM capacity (veh/h)			783		120	365

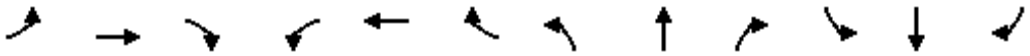
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	675	327	423	274
Volume Left	0	115	0	157
Volume Right	89	0	0	118
cSH	1700	783	1700	169
Volume to Capacity	0.40	0.15	0.25	1.62
Queue Length 95th (m)	0.0	3.9	0.0	142.0
Control Delay (s)	0.0	4.8	0.0	354.8
Lane LOS		A		F
Approach Delay (s)	0.0	2.1		354.8
Approach LOS				F

Intersection Summary			
Average Delay	58.2		
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	124	166	58	45	332	186	84	243	48	79	143	78
Peak Hour Factor	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Hourly flow rate (vph)	153	218	73	69	346	224	120	286	53	118	170	92

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	445	415	224	459	380
Volume Left (vph)	153	69	0	120	118
Volume Right (vph)	73	0	224	53	92
Hadj (s)	0.00	0.12	-0.67	0.02	-0.05
Departure Headway (s)	9.6	9.8	9.0	9.5	9.5
Degree Utilization, x	1.19	1.13	0.56	1.22	1.00
Capacity (veh/h)	378	380	389	382	380
Control Delay (s)	139.1	116.4	21.7	148.8	77.9
Approach Delay (s)	139.1	83.2		148.8	77.9
Approach LOS	F	F		F	F

Intersection Summary				
Delay	110.8			
HCM Level of Service	F			
Intersection Capacity Utilization	76.7%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1732	1498		1855	1355	1668	1799	
Flt Permitted		0.98			0.69	1.00		0.95	1.00	0.12	1.00	
Satd. Flow (perm)		1920			1216	1498		1770	1355	218	1799	
Volume (vph)	12	193	56	96	217	417	53	613	173	275	273	16
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	208	60	97	219	421	55	639	180	281	279	16
RTOR Reduction (vph)	0	12	0	0	0	229	0	0	99	0	3	0
Lane Group Flow (vph)	0	269	0	0	316	192	0	694	81	281	292	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.0			20.0	20.0		33.0	33.0	46.0	46.0	
Effective Green, g (s)		23.0			23.0	23.0		36.0	36.0	49.0	49.0	
Actuated g/C Ratio		0.29			0.29	0.29		0.45	0.45	0.61	0.61	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		552			350	431		797	610	297	1102	
v/s Ratio Prot										c0.11	0.16	
v/s Ratio Perm		0.14			c0.26	0.13		0.39	0.06	c0.47		
v/c Ratio		0.49			0.90	0.44		0.87	0.13	0.95	0.27	
Uniform Delay, d1		23.6			27.4	23.3		19.9	12.9	19.1	7.2	
Progression Factor		1.00			1.00	1.00		0.79	1.15	1.00	1.00	
Incremental Delay, d2		3.1			28.8	3.3		7.8	0.3	40.1	0.6	
Delay (s)		26.7			56.2	26.6		23.6	15.0	59.2	7.8	
Level of Service		C			E	C		C	B	E	A	
Approach Delay (s)		26.7			39.3			21.8			32.8	
Approach LOS		C			D			C			C	

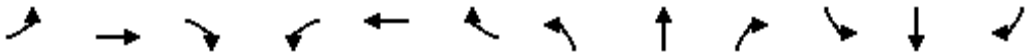
Intersection Summary			
HCM Average Control Delay	30.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.92			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1705	1710		1680	1892	1316		3050			3424	1386
Flt Permitted	0.31	1.00		0.30	1.00	1.00		0.77			0.60	1.00
Satd. Flow (perm)	558	1710		538	1892	1316		2382			2071	1386
Volume (vph)	86	257	97	87	439	75	124	478	167	64	235	51
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	112	317	143	102	453	95	170	525	226	107	264	60
RTOR Reduction (vph)	0	20	0	0	0	45	0	40	0	0	0	30
Lane Group Flow (vph)	112	440	0	102	453	50	0	882	0	0	371	30
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	223	684		215	757	526		1191			1036	693
v/s Ratio Prot		c0.26			0.24							
v/s Ratio Perm	0.20			0.19		0.04		c0.37			0.18	0.02
v/c Ratio	0.50	0.64		0.47	0.60	0.10		0.74			0.36	0.04
Uniform Delay, d1	18.0	19.4		17.8	18.9	15.0		15.9			12.2	10.2
Progression Factor	1.00	1.01		1.00	1.00	1.00		0.88			0.93	0.92
Incremental Delay, d2	7.8	4.6		7.3	3.5	0.4		3.7			0.9	0.1
Delay (s)	25.9	24.1		25.1	22.4	15.3		17.6			12.3	9.5
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		24.4			21.8			17.6			11.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

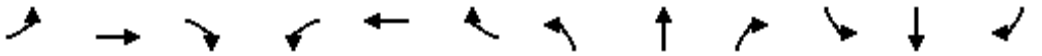
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	0	0	13	162	75	11	52	27	38	61	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	176	82	12	57	29	41	66	68
Pedestrians		45			51			36			74	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	567	389	182	365	409	196	180			137		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	567	389	182	365	409	196	180			137		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	64	89	99			97		
cM capacity (veh/h)	247	502	835	514	490	757	1396			1384		

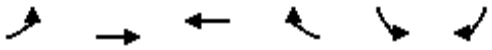
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	272	98	176
Volume Left	14	12	41
Volume Right	82	29	68
cSH	549	1396	1384
Volume to Capacity	0.49	0.01	0.03
Queue Length 95th (m)	20.7	0.2	0.7
Control Delay (s)	17.8	1.0	2.0
Lane LOS	C	A	A
Approach Delay (s)	17.8	1.0	2.0
Approach LOS	C		

Intersection Summary				
Average Delay	9.7			
Intersection Capacity Utilization	39.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.87		1.00	1.00	0.56
Flpb, ped/bikes	1.00	1.00	1.00		0.96	1.00	0.77	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1616	1448	354		1541	684	1332	1546		1723	1739	855
Flt Permitted	0.31	1.00	1.00		0.94	1.00	0.53	1.00		0.19	1.00	1.00
Satd. Flow (perm)	522	1448	354		1457	684	748	1546		353	1739	855
Volume (vph)	78	244	61	31	263	127	89	612	107	104	279	70
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	84	274	73	40	351	149	107	644	134	133	310	84
RTOR Reduction (vph)	0	0	49	0	0	21	0	4	0	0	0	0
Lane Group Flow (vph)	84	274	24	0	391	128	107	774	0	133	310	84
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	23.0	23.0	23.0		23.0	23.0	43.0	43.0		43.0	43.0	43.0
Effective Green, g (s)	26.0	26.0	26.0		26.0	26.0	46.0	46.0		46.0	46.0	46.0
Actuated g/C Ratio	0.32	0.32	0.32		0.32	0.32	0.57	0.57		0.57	0.57	0.57
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	170	471	115		474	222	430	889		203	1000	492
v/s Ratio Prot		0.19						c0.50			0.18	
v/s Ratio Perm	0.16		0.07		c0.27	0.19	0.14			0.38		0.10
v/c Ratio	0.49	0.58	0.21		0.82	0.58	0.25	0.87		0.66	0.31	0.17
Uniform Delay, d1	21.7	22.5	19.5		24.9	22.4	8.4	14.5		11.6	8.8	8.0
Progression Factor	0.98	0.94	1.24		0.77	0.71	1.12	1.23		0.82	0.75	0.73
Incremental Delay, d2	9.0	4.7	3.7		14.1	9.8	1.3	10.8		14.6	0.8	0.7
Delay (s)	30.2	25.7	28.0		33.3	25.8	10.8	28.6		24.1	7.3	6.6
Level of Service	C	C	C		C	C	B	C		C	A	A
Approach Delay (s)		27.0			31.2			26.5			11.4	
Approach LOS		C			C			C			B	

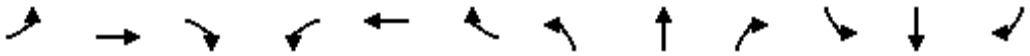
Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	18	358	526	8	26	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	389	572	9	28	46
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	664				1091	660
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664				1091	660
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				87	89
cM capacity (veh/h)	858				215	430

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	580	74
Volume Left	20	0	28
Volume Right	0	9	46
cSH	858	1700	311
Volume to Capacity	0.02	0.34	0.24
Queue Length 95th (m)	0.5	0.0	6.9
Control Delay (s)	0.7	0.0	20.2
Lane LOS	A		C
Approach Delay (s)	0.7	0.0	20.2
Approach LOS			C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.85			0.93			0.85			0.75	
Flpb, ped/bikes		1.00			1.00			0.94			0.95	
Frt		0.98			0.99			0.97			0.95	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		1262			1474			1573			1432	
Flt Permitted		1.00			1.00			0.89			0.95	
Satd. Flow (perm)		1262			1474			1419			1363	
Volume (vph)	0	329	44	0	353	25	32	92	21	12	76	74
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	0	366	71	0	401	36	41	96	40	31	112	92
RTOR Reduction (vph)	0	9	0	0	4	0	0	13	0	0	8	0
Lane Group Flow (vph)	0	428	0	0	433	0	0	164	0	0	227	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		43.0			43.0			25.0			25.0	
Effective Green, g (s)		45.0			45.0			27.0			27.0	
Actuated g/C Ratio		0.56			0.56			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		710			829			479			460	
v/s Ratio Prot		c0.34			0.29							
v/s Ratio Perm								0.12			c0.17	
v/c Ratio		0.60			0.52			0.34			0.49	
Uniform Delay, d1		11.6			10.8			19.8			21.1	
Progression Factor		1.03			0.75			0.97			1.03	
Incremental Delay, d2		2.8			2.0			1.9			3.7	
Delay (s)		14.7			10.2			21.2			25.5	
Level of Service		B			B			C			C	
Approach Delay (s)		14.7			10.2			21.2			25.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

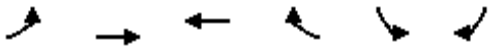
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	16	54	7	12	195	28	17	24	20	26	22	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	59	8	13	212	30	18	26	22	28	24	47
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	457	323	170	322	335	164	146			107		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	457	323	170	322	335	164	146			107		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	89	99	97	58	96	99			98		
cM capacity (veh/h)	263	511	784	464	503	787	1344			1409		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	84	255	66	99
Volume Left	17	13	18	28
Volume Right	8	30	22	47
cSH	439	523	1344	1409
Volume to Capacity	0.19	0.49	0.01	0.02
Queue Length 95th (m)	5.3	20.2	0.3	0.5
Control Delay (s)	15.1	18.3	2.2	2.3
Lane LOS	C	C	A	A
Approach Delay (s)	15.1	18.3	2.2	2.3
Approach LOS	C	C		

Intersection Summary			
Average Delay	12.5		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.83		1.00	1.00		1.00	0.83			1.00	
Flpb, ped/bikes	1.00	1.00		0.74	1.00		0.71	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.94			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1807	1229		1240	1576		1161	1458			1852	
Flt Permitted	0.46	1.00		0.43	1.00		0.55	1.00			0.95	
Satd. Flow (perm)	869	1229		561	1576		669	1458			1755	
Volume (vph)	55	289	62	175	287	26	157	340	237	6	199	27
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	60	307	85	250	334	28	218	370	255	7	216	29
RTOR Reduction (vph)	0	12	0	0	4	0	0	24	0	0	6	0
Lane Group Flow (vph)	60	380	0	250	358	0	218	601	0	0	246	0
Confl. Peds. (#/hr)			420	420			271		340			
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	37.0		37.0	37.0		31.0	31.0			31.0	
Effective Green, g (s)	39.0	39.0		39.0	39.0		33.0	33.0			33.0	
Actuated g/C Ratio	0.49	0.49		0.49	0.49		0.41	0.41			0.41	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	424	599		273	768		276	601			724	
v/s Ratio Prot		0.31			0.23			c0.41				
v/s Ratio Perm	0.07			c0.45			0.33				0.14	
v/c Ratio	0.14	0.63		0.92	0.47		0.79	1.00			0.34	
Uniform Delay, d1	11.3	15.2		19.0	13.6		20.5	23.5			16.1	
Progression Factor	0.97	0.87		1.00	1.00		1.00	1.00			1.03	
Incremental Delay, d2	0.6	4.6		36.5	2.0		20.2	36.7			1.3	
Delay (s)	11.5	17.8		55.5	15.6		40.7	60.2			17.8	
Level of Service	B	B		E	B		D	E			B	
Approach Delay (s)		17.0			31.9			55.1			17.8	
Approach LOS		B			C			E			B	

Intersection Summary			
HCM Average Control Delay	36.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Volume (veh/h)	201	354	361	165	30	129
Peak Hour Factor	0.94	0.91	0.85	0.96	0.92	0.92
Hourly flow rate (vph)	214	389	425	172	33	140
Pedestrians		16	33		435	
Lane Width (m)		3.0	3.0		4.8	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		1	2		48	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	1032				1709	876
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1032				1709	876
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	37				0	21
cM capacity (veh/h)	342				19	177

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	214	389	425	172	173
Volume Left	214	0	0	0	33
Volume Right	0	0	0	172	140
cSH	342	1700	1700	1700	69
Volume to Capacity	0.63	0.23	0.25	0.10	2.49
Queue Length 95th (m)	30.4	0.0	0.0	0.0	127.7
Control Delay (s)	31.6	0.0	0.0	0.0	806.6
Lane LOS	D				F
Approach Delay (s)	11.2		0.0		806.6
Approach LOS					F

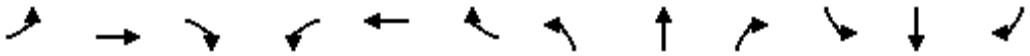
Intersection Summary			
Average Delay	106.5		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	425	82	38	397	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	462	89	41	432	0	0
Pedestrians	591				630	
Lane Width (m)	3.0				0.0	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	41				0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.86		0.93	0.86
vC, conflicting volume			1181		2242	1137
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1211		2120	1159
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		100	100
cM capacity (veh/h)			495		28	205

Direction, Lane #	EB 1	WB 1
Volume Total	551	473
Volume Left	0	41
Volume Right	89	0
cSH	1700	495
Volume to Capacity	0.32	0.08
Queue Length 95th (m)	0.0	2.1
Control Delay (s)	0.0	2.5
Lane LOS		A
Approach Delay (s)	0.0	2.5
Approach LOS		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	16	217	0	52	0	0	0	31	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	17	236	0	57	0	0	0	34	87
Pedestrians		28			32			60			84	
Lane Width (m)		0.0			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	420	250	165	282	294	116	149			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	420	250	165	282	294	116	149			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	59	100	96			100		
cM capacity (veh/h)	328	610	834	587	577	845	1433			1537		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	253	57	121
Volume Left	17	57	0
Volume Right	0	0	87
cSH	577	1433	1700
Volume to Capacity	0.44	0.04	0.07
Queue Length 95th (m)	16.9	0.9	0.0
Control Delay (s)	16.0	7.6	0.0
Lane LOS	C	A	
Approach Delay (s)	16.0	7.6	0.0
Approach LOS	C		

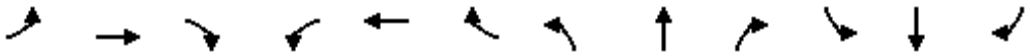
Intersection Summary				
Average Delay	10.4			
Intersection Capacity Utilization	32.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	60	344	536	0	0	284
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	374	583	0	0	309
Pedestrians	52		163			169
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	1106	804			635	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1105	763			558	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	59	0			100	
cM capacity (veh/h)	160	274			801	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	65	374	583	309
Volume Left	65	0	0	0
Volume Right	0	374	0	0
cSH	160	274	1700	1700
Volume to Capacity	0.41	1.37	0.34	0.18
Queue Length 95th (m)	13.6	149.5	0.0	0.0
Control Delay (s)	42.2	222.9	0.0	0.0
Lane LOS	E	F		
Approach Delay (s)	196.0		0.0	0.0
Approach LOS	F			

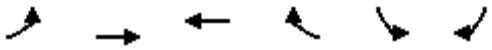
Intersection Summary			
Average Delay	64.7		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	33	54	20	40	74	175	54	432	87	134	192	106
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)	36	59	22	43	80	190	59	470	95	146	209	115
Pedestrians		94			157			19			78	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			13			2			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1594	1490	379	1419	1500	752	418			721		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1637	1525	335	1449	1536	752	376			721		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	12	96	0	0	43	94			81		
cM capacity (veh/h)	0	67	597	15	66	331	1015			762		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	116	314	623	470
Volume Left	36	43	59	146
Volume Right	22	190	95	115
cSH	0	68	1015	762
Volume to Capacity	Err	4.61	0.06	0.19
Queue Length 95th (m)	Err	Err	1.4	5.3
Control Delay (s)	Err	Err	1.5	5.1
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	1.5	5.1
Approach LOS	F	F		

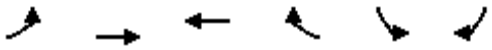
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	64	345	491	8	23	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	375	534	9	25	38
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		168				
pX, platoon unblocked						
vC, conflicting volume	573				1143	682
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	573				1143	682
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				87	90
cM capacity (veh/h)	973				190	395

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	445	542	63
Volume Left	70	0	25
Volume Right	0	9	38
cSH	973	1700	277
Volume to Capacity	0.07	0.32	0.23
Queue Length 95th (m)	1.8	0.0	6.5
Control Delay (s)	2.1	0.0	21.8
Lane LOS	A		C
Approach Delay (s)	2.1	0.0	21.8
Approach LOS			C

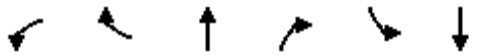
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	42	293	475	16	9	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	318	516	17	10	42
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	583				1083	707
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583				1083	707
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				95	89
cM capacity (veh/h)	950				201	370

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	364	534	52
Volume Left	46	0	10
Volume Right	0	17	42
cSH	950	1700	319
Volume to Capacity	0.05	0.31	0.16
Queue Length 95th (m)	1.1	0.0	4.4
Control Delay (s)	1.6	0.0	18.5
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	18.5
Approach LOS			C

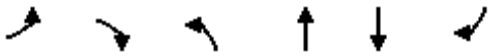
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	27	24	115	29	38	206
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	26	125	32	41	224
Pedestrians	102		74			46
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	9		6			4
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	623	289			259	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	623	289			259	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	96			97	
cM capacity (veh/h)	371	658			1192	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	55	157	265
Volume Left	29	0	41
Volume Right	26	32	0
cSH	467	1700	1192
Volume to Capacity	0.12	0.09	0.03
Queue Length 95th (m)	3.0	0.0	0.8
Control Delay (s)	13.7	0.0	1.5
Lane LOS	B		A
Approach Delay (s)	13.7	0.0	1.5
Approach LOS	B		

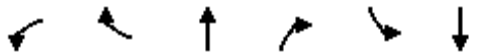
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	85	19	4	290	140	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	21	4	315	152	70
Pedestrians	141			14	26	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	12			1	2	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	678	342	363			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	678	342	363			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	97	100			
cM capacity (veh/h)	358	609	1051			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	113	320	222
Volume Left	92	4	0
Volume Right	21	0	70
cSH	387	1051	1700
Volume to Capacity	0.29	0.00	0.13
Queue Length 95th (m)	9.1	0.1	0.0
Control Delay (s)	18.1	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	18.1	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	30	28	320	84	38	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	30	348	91	41	218
Pedestrians	75		75			81
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		6			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			59			
pX, platoon unblocked						
vC, conflicting volume	845	549			514	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	845	549			514	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	93			96	
cM capacity (veh/h)	280	466			984	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	63	439	260
Volume Left	33	0	41
Volume Right	30	91	0
cSH	347	1700	984
Volume to Capacity	0.18	0.26	0.04
Queue Length 95th (m)	5.0	0.0	1.0
Control Delay (s)	17.7	0.0	1.8
Lane LOS	C		A
Approach Delay (s)	17.7	0.0	1.8
Approach LOS	C		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

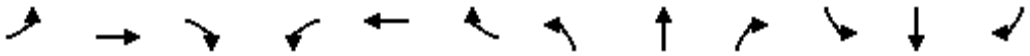
174: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.2	0.1	0.8	0.2	1.3
Delay / Veh (s)	1.8	1.8	20.1	8.9	5.4
Stop Delay (hr)	0.1	0.0	0.8	0.2	1.0
St Del/Veh (s)	0.7	0.5	18.6	8.6	4.3
Total Stops	27	19	145	44	235
Travel Dist (km)	41.9	29.5	13.1	4.0	88.5
Travel Time (hr)	1.3	0.8	1.2	0.3	3.7
Avg Speed (kph)	33	37	11	13	25
Fuel Used (l)	60.4	28.9	21.8	6.6	117.7
HC Emissions (g)	2	1	1	0	4
CO Emissions (g)	902	350	205	47	1504
NOx Emissions (g)	9	4	2	1	15
Vehicles Entered	359	290	147	64	860
Vehicles Exited	359	290	146	64	859
Hourly Exit Rate	359	290	146	64	859
Input Volume	365	357	154	63	940
% of Volume	98	81	95	101	91
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	SB	All
Total Delay (hr)	1.3	0.4	2.0	0.9	4.6
Delay / Veh (s)	11.5	3.5	68.8	31.9	16.2
Stop Delay (hr)	1.0	0.2	1.9	0.9	4.0
St Del/Veh (s)	9.5	1.6	67.3	31.2	14.4
Total Stops	148	45	109	57	359
Travel Dist (km)	28.2	30.3	13.4	11.0	82.9
Travel Time (hr)	2.2	1.2	2.3	1.4	7.0
Avg Speed (kph)	14	26	6	8	12
Fuel Used (l)	51.6	47.6	32.5	23.4	155.0
HC Emissions (g)	8	4	0	1	14
CO Emissions (g)	1589	1048	230	235	3102
NOx Emissions (g)	22	13	2	2	39
Vehicles Entered	395	406	100	105	1006
Vehicles Exited	395	406	102	106	1009
Hourly Exit Rate	395	406	102	106	1009
Input Volume	399	471	98	114	1082
% of Volume	99	86	104	93	93
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Scenario C 2020 AM with background traffic growth and development



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.90	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1462	1608			1517		1626	1625		1472	1497	
Flt Permitted	0.61	1.00			0.89		0.11	1.00		0.58	1.00	
Satd. Flow (perm)	933	1608			1362		190	1625		901	1497	
Volume (vph)	262	347	37	7	36	34	9	165	25	224	281	508
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	288	369	53	18	42	41	18	206	36	238	339	591
RTOR Reduction (vph)	0	7	0	0	31	0	0	9	0	0	87	0
Lane Group Flow (vph)	288	415	0	0	70	0	18	234	0	238	843	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.0	26.0			16.0		34.0	34.0		34.0	34.0	
Effective Green, g (s)	28.0	28.0			18.0		36.0	36.0		36.0	36.0	
Actuated g/C Ratio	0.39	0.39			0.25		0.50	0.50		0.50	0.50	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	407	625			341		95	813		451	749	
v/s Ratio Prot	0.06	c0.26						0.14			c0.56	
v/s Ratio Perm	c0.22				0.05		0.09			0.26		
v/c Ratio	0.71	0.66			0.21		0.19	0.29		0.53	1.13	
Uniform Delay, d1	19.4	18.1			21.3		9.9	10.5		12.2	18.0	
Progression Factor	1.00	1.00			1.43		1.05	1.06		0.91	0.72	
Incremental Delay, d2	10.0	5.5			1.4		4.4	0.9		3.4	69.9	
Delay (s)	29.3	23.6			31.9		14.8	12.0		14.5	83.0	
Level of Service	C	C			C		B	B		B	F	
Approach Delay (s)		25.9			31.9			12.2			69.0	
Approach LOS		C			C			B			E	

Intersection Summary			
HCM Average Control Delay	47.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.94			1.00	1.00	0.95
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1667			3605	1789	1528
Flt Permitted	1.00			0.56	0.95	1.00
Satd. Flow (perm)	1667			2057	1789	1528
Volume (vph)	561	199	152	424	97	152
Peak-hour factor, PHF	0.91	0.82	0.87	0.82	0.85	0.88
Adj. Flow (vph)	616	243	175	517	114	173
RTOR Reduction (vph)	18	0	0	0	0	138
Lane Group Flow (vph)	841	0	0	692	114	35
Confl. Peds. (#/hr)		44	44		4	5
Confl. Bikes (#/hr)		31				2
Heavy Vehicles (%)	2%	1%	2%	2%	0%	0%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	53.0			53.0	13.0	13.0
Effective Green, g (s)	56.0			56.0	16.0	16.0
Actuated g/C Ratio	0.70			0.70	0.20	0.20
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1167			1440	358	306
v/s Ratio Prot	c0.50				c0.06	
v/s Ratio Perm				0.34		0.02
v/c Ratio	0.72			0.48	0.32	0.11
Uniform Delay, d1	7.3			5.4	27.3	26.2
Progression Factor	1.29			1.00	1.09	1.45
Incremental Delay, d2	3.2			1.2	2.3	0.7
Delay (s)	12.5			6.6	32.0	38.6
Level of Service	B			A	C	D
Approach Delay (s)	12.5			6.6	36.0	
Approach LOS	B			A	D	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

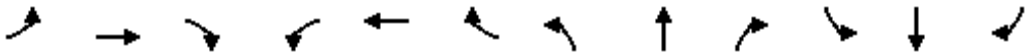
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	848	170	131	425	0	0
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	874	175	149	483	0	0
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.72		0.75	0.72
vC, conflicting volume			1084		1538	1005
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1117		1533	1007
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			67		100	100
cM capacity (veh/h)			449		53	171

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	1049	310	322
Volume Left	0	149	0
Volume Right	175	0	0
cSH	1700	449	1700
Volume to Capacity	0.62	0.33	0.19
Queue Length 95th (m)	0.0	10.9	0.0
Control Delay (s)	0.0	11.4	0.0
Lane LOS		B	
Approach Delay (s)	0.0	5.6	
Approach LOS			

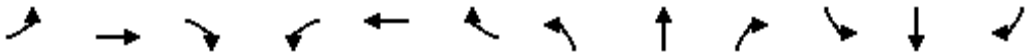
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	101	225	50	44	141	47	36	141	54	148	180	34
Peak Hour Factor	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Hourly flow rate (vph)	104	232	52	47	150	50	40	158	61	156	189	36

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	388	197	50	260	381
Volume Left (vph)	104	47	0	40	156
Volume Right (vph)	52	0	50	61	36
Hadj (s)	0.01	0.15	-0.67	-0.08	0.06
Departure Headway (s)	7.1	8.0	7.2	7.2	7.0
Degree Utilization, x	0.76	0.44	0.10	0.52	0.74
Capacity (veh/h)	485	395	426	438	484
Control Delay (s)	29.1	15.9	9.8	17.9	27.4
Approach Delay (s)	29.1	14.7		17.9	27.4
Approach LOS	D	B		C	D

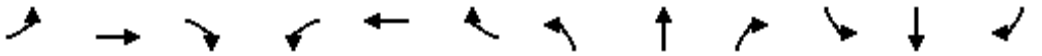
Intersection Summary				
Delay	23.5			
HCM Level of Service	C			
Intersection Capacity Utilization	82.4%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2001			1715	1502		1857	1350	1639	1812	
Flt Permitted		0.98			0.64	1.00		0.96	1.00	0.34	1.00	
Satd. Flow (perm)		1967			1119	1502		1790	1350	587	1812	
Volume (vph)	11	218	39	109	166	140	17	257	115	488	351	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	237	42	115	175	147	19	286	128	530	382	7
RTOR Reduction (vph)	0	8	0	0	0	101	0	0	90	0	1	0
Lane Group Flow (vph)	0	283	0	0	290	46	0	305	38	530	388	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		21.0	21.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		24.0	24.0	47.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.30	0.30	0.59	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		615			350	469		537	405	595	1065	
v/s Ratio Prot										c0.21	0.21	
v/s Ratio Perm		0.14			c0.26	0.03		0.17	0.03	c0.31		
v/c Ratio		0.46			0.83	0.10		0.57	0.09	0.89	0.36	
Uniform Delay, d1		22.1			25.5	19.5		23.6	20.2	11.8	8.7	
Progression Factor		1.00			0.87	0.55		0.93	1.37	1.00	1.00	
Incremental Delay, d2		2.5			18.3	0.4		3.5	0.4	18.0	1.0	
Delay (s)		24.6			40.4	11.0		25.4	28.0	29.9	9.6	
Level of Service		C			D	B		C	C	C	A	
Approach Delay (s)		24.6			30.5			26.2			21.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

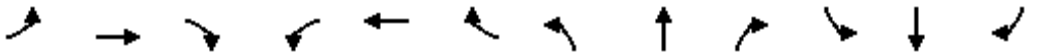
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1592	1659		1681	1874	1369		3215			3486	1527
Flt Permitted	0.57	1.00		0.30	1.00	1.00		0.66			0.66	1.00
Satd. Flow (perm)	958	1659		538	1874	1369		2156			2338	1527
Volume (vph)	40	212	188	58	186	35	97	316	105	106	373	44
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	252	219	66	221	49	156	395	114	129	455	81
RTOR Reduction (vph)	0	39	0	0	0	29	0	22	0	0	0	42
Lane Group Flow (vph)	49	432	0	66	221	20	0	643	0	0	584	39
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	395	684		222	773	565		1051			1140	744
v/s Ratio Prot		c0.26			0.12							
v/s Ratio Perm	0.05			0.12		0.01		c0.30			0.25	0.03
v/c Ratio	0.12	0.63		0.30	0.29	0.04		0.61			0.51	0.05
Uniform Delay, d1	14.6	18.7		15.7	15.7	14.0		15.0			14.0	10.8
Progression Factor	0.97	0.92		1.00	1.00	1.00		0.65			0.84	0.59
Incremental Delay, d2	0.6	4.2		3.4	0.9	0.1		2.4			1.5	0.1
Delay (s)	14.8	21.3		19.1	16.6	14.1		12.2			13.4	6.5
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		20.7			16.7			12.2			12.5	
Approach LOS		C			B			B			B	

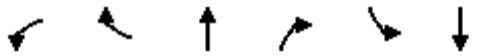
Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.89		1.00	1.00	0.68
Flpb, ped/bikes	0.76	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1209	1564	545		1316	802	1658	1571		1790	1773	1021
Flt Permitted	0.54	1.00	1.00		0.91	1.00	0.37	1.00		0.30	1.00	1.00
Satd. Flow (perm)	688	1564	545		1211	802	641	1571		569	1773	1021
Volume (vph)	79	206	97	35	175	75	53	408	72	67	411	49
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	130	245	117	41	194	90	73	469	104	100	489	53
RTOR Reduction (vph)	0	0	73	0	0	56	0	10	0	0	0	17
Lane Group Flow (vph)	130	245	44	0	235	34	73	563	0	100	489	36
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	27.0	27.0	27.0		27.0	27.0	39.0	39.0		39.0	39.0	39.0
Effective Green, g (s)	30.0	30.0	30.0		30.0	30.0	42.0	42.0		42.0	42.0	42.0
Actuated g/C Ratio	0.38	0.38	0.38		0.38	0.38	0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	258	587	204		454	301	337	825		299	931	536
v/s Ratio Prot		0.16						c0.36			0.28	
v/s Ratio Perm	0.19		0.08		c0.19	0.04	0.11			0.18		0.04
v/c Ratio	0.50	0.42	0.22		0.52	0.11	0.22	0.68		0.33	0.53	0.07
Uniform Delay, d1	19.3	18.5	17.0		19.4	16.3	10.2	14.1		10.9	12.5	9.4
Progression Factor	1.00	1.00	1.00		0.71	0.31	1.13	1.27		0.75	0.77	0.61
Incremental Delay, d2	6.9	2.2	2.4		4.1	0.7	1.4	4.3		2.8	2.0	0.2
Delay (s)	26.1	20.7	19.4		17.8	5.9	12.9	22.2		11.0	11.6	5.9
Level of Service	C	C	B		B	A	B	C		B	B	A
Approach Delay (s)		21.8			14.5			21.2			11.1	
Approach LOS		C			B			C			B	

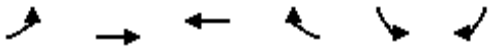
Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	34	99	425	0	18	488
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	108	462	0	20	530
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.91	0.87			0.87	
vC, conflicting volume	1238	619			534	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1051	563			466	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	73			98	
cM capacity (veh/h)	186	399			897	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	145	462	550
Volume Left	37	0	20
Volume Right	108	0	0
cSH	309	1700	897
Volume to Capacity	0.47	0.27	0.02
Queue Length 95th (m)	18.0	0.0	0.5
Control Delay (s)	26.5	0.0	0.6
Lane LOS	D		A
Approach Delay (s)	26.5	0.0	0.6
Approach LOS	D		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	9	363	247	5	20	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	395	268	5	22	13
Pedestrians		1	3		80	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	354				768	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354				768	352
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	1122				340	643

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	404	274	35
Volume Left	10	0	22
Volume Right	0	5	13
cSH	1122	1700	413
Volume to Capacity	0.01	0.16	0.08
Queue Length 95th (m)	0.2	0.0	2.1
Control Delay (s)	0.3	0.0	14.5
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	14.5
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						1.00	
Frpb, ped/bikes		0.90		1.00	1.00						0.81	
Flpb, ped/bikes		1.00		0.76	1.00						0.92	
Frt		0.98		1.00	1.00						0.95	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1408		1282	1364						1518	
Flt Permitted		1.00		0.46	1.00						0.99	
Satd. Flow (perm)		1408		619	1364						1518	
Volume (vph)	0	275	47	25	207	0	0	0	0	25	84	57
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	0	327	64	42	241	0	0	0	0	33	109	79
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	382	0	42	241	0	0	0	0	0	196	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		42.0		42.0	42.0						26.0	
Effective Green, g (s)		44.0		44.0	44.0						28.0	
Actuated g/C Ratio		0.55		0.55	0.55						0.35	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Lane Grp Cap (vph)		774		340	750						531	
v/s Ratio Prot		c0.27			0.18							
v/s Ratio Perm				0.07							0.13	
v/c Ratio		0.49		0.12	0.32						0.37	
Uniform Delay, d1		11.1		8.7	9.8						19.4	
Progression Factor		0.73		0.78	0.81						0.93	
Incremental Delay, d2		2.1		0.7	1.0						1.9	
Delay (s)		10.2		7.5	9.0						20.0	
Level of Service		B		A	A						B	
Approach Delay (s)		10.2			8.8			0.0			20.0	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



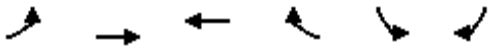
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	46	17	129	0	0	425
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	18	140	0	0	462
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			61			237
pX, platoon unblocked						
vC, conflicting volume	647	186			161	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	647	186			161	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	98			100	
cM capacity (veh/h)	419	823			1392	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	140	462
Volume Left	50	0	0
Volume Right	18	0	0
cSH	483	1700	1700
Volume to Capacity	0.14	0.08	0.27
Queue Length 95th (m)	3.7	0.0	0.0
Control Delay (s)	13.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.7	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.88		1.00	0.98		1.00	0.81			0.89	
Flpb, ped/bikes		0.95		0.70	1.00		1.00	1.00			0.98	
Frt		0.97		1.00	0.99		1.00	0.91			0.96	
Flt Protected		0.99		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2482		1156	1400		1503	1386			1785	
Flt Permitted		0.88		0.49	1.00		0.35	1.00			0.92	
Satd. Flow (perm)		2205		600	1400		550	1386			1650	
Volume (vph)	32	219	64	141	227	7	46	112	140	36	279	111
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	53	274	83	178	252	9	55	126	184	65	317	139
RTOR Reduction (vph)	0	28	0	0	2	0	0	66	0	0	16	0
Lane Group Flow (vph)	0	382	0	178	260	0	55	244	0	0	505	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		38.0		38.0	38.0		30.0	30.0			30.0	
Effective Green, g (s)		40.0		40.0	40.0		32.0	32.0			32.0	
Actuated g/C Ratio		0.50		0.50	0.50		0.40	0.40			0.40	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1103		300	700		220	554			660	
v/s Ratio Prot					0.19			0.18				
v/s Ratio Perm		0.17		c0.30			0.10				c0.31	
v/c Ratio		0.35		0.59	0.37		0.25	0.44			0.76	
Uniform Delay, d1		12.1		14.2	12.3		16.0	17.5			20.7	
Progression Factor		0.81		1.00	1.00		1.00	1.00			1.19	
Incremental Delay, d2		0.8		8.4	1.5		2.7	2.5			7.3	
Delay (s)		10.6		22.6	13.8		18.7	20.0			32.0	
Level of Service		B		C	B		B	C			C	
Approach Delay (s)		10.6			17.4			19.8			32.0	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Volume (veh/h)	145	212	209	31	61	150
Peak Hour Factor	0.85	0.78	0.90	0.88	1.00	0.93
Hourly flow rate (vph)	171	272	232	35	61	161
Pedestrians		37	65		330	
Lane Width (m)		3.0	3.0		4.8	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		3	5		37	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	597				1240	599
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	597				1240	599
tC, single (s)	4.1				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	72				33	48
cM capacity (veh/h)	614				91	310

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	171	272	232	35	222
Volume Left	171	0	0	0	61
Volume Right	0	0	0	35	161
cSH	614	1700	1700	1700	187
Volume to Capacity	0.28	0.16	0.14	0.02	1.19
Queue Length 95th (m)	8.6	0.0	0.0	0.0	88.3
Control Delay (s)	13.1	0.0	0.0	0.0	177.5
Lane LOS	B				F
Approach Delay (s)	5.1		0.0		177.5
Approach LOS					F

Intersection Summary			
Average Delay	44.7		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

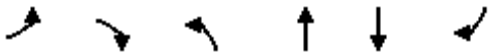
* User Entered Value



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	335	50	22	231	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	364	54	24	251	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.91		0.93	0.91
vC, conflicting volume			418		990	391
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			361		924	331
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1090		215	647

Direction, Lane #	EB 1	WB 1
Volume Total	418	275
Volume Left	0	24
Volume Right	54	0
cSH	1700	1090
Volume to Capacity	0.25	0.02
Queue Length 95th (m)	0.0	0.5
Control Delay (s)	0.0	0.9
Lane LOS		A
Approach Delay (s)	0.0	0.9
Approach LOS		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	0	0	17	94	142	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	18	102	154	23
Pedestrians	24					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	329	190	201			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	329	190	201			
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	100	99			
cM capacity (veh/h)	657	852	1371			

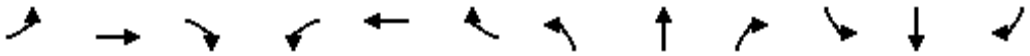
Direction, Lane #	NB 1	SB 1
Volume Total	121	177
Volume Left	18	0
Volume Right	0	23
cSH	1371	1700
Volume to Capacity	0.01	0.10
Queue Length 95th (m)	0.3	0.0
Control Delay (s)	1.3	0.0
Lane LOS	A	
Approach Delay (s)	1.3	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	14	0	8	59	0	16	0	18	35	54	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	0	9	64	0	17	0	20	38	59	30
Pedestrians		75			31			31			28	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	330	310	180	264	316	69	164			51		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	330	310	180	264	316	69	164			51		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	100	98	88	100	99			97		
cM capacity (veh/h)	468	530	786	578	526	945	1323			1515		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	73	37	127
Volume Left	0	9	17	38
Volume Right	0	0	20	30
cSH	530	532	1323	1515
Volume to Capacity	0.03	0.14	0.01	0.03
Queue Length 95th (m)	0.7	3.6	0.3	0.6
Control Delay (s)	12.0	12.8	3.7	2.4
Lane LOS	B	B	A	A
Approach Delay (s)	12.0	12.8	3.7	2.4
Approach LOS	B	B		

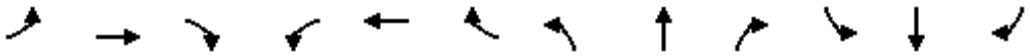
Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	29	42	10	5	55	45	7	22	3	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)	32	46	11	5	60	49	8	24	3	0	0	0
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	178	126	90	150	125	70	49			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	126	90	150	125	70	49			62		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	94	99	99	92	95	99			100		
cM capacity (veh/h)	629	706	895	677	708	964	1492			1495		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	88	114	35
Volume Left	32	5	8
Volume Right	11	49	3
cSH	694	797	1492
Volume to Capacity	0.13	0.14	0.01
Queue Length 95th (m)	3.3	3.8	0.1
Control Delay (s)	10.9	10.3	1.7
Lane LOS	B	B	A
Approach Delay (s)	10.9	10.3	1.7
Approach LOS	B	B	

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	31.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	14	0	4	89	0	6	0	0	0	41	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	0	4	97	0	7	0	0	0	45	34
Pedestrians		90			18			48			50	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	263	182	199	148	199	68	168			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263	182	199	148	199	68	168			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	100	99	85	100	99			100		
cM capacity (veh/h)	499	643	745	705	630	938	1301			1574		

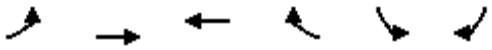
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	101	7	78
Volume Left	0	4	7	0
Volume Right	0	0	0	34
cSH	643	633	1301	1574
Volume to Capacity	0.02	0.16	0.01	0.00
Queue Length 95th (m)	0.6	4.3	0.1	0.0
Control Delay (s)	10.7	11.8	7.8	0.0
Lane LOS	B	B	A	
Approach Delay (s)	10.7	11.8	7.8	0.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	32.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	23	9	4	19	13	29	15	236	30	107	312	56
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)	25	10	4	21	14	32	16	257	33	116	339	61
Pedestrians		85			165			17			83	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			14			1			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	1.00	1.00	1.00	1.00	1.00		1.00					
vC, conflicting volume	1114	1174	472	1099	1188	521	485			454		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1114	1174	471	1099	1188	521	484			454		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	93	99	82	89	93	98			88		
cM capacity (veh/h)	103	132	541	114	129	443	999			950		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	39	66	305	516
Volume Left	25	21	16	116
Volume Right	4	32	33	61
cSH	121	183	999	950
Volume to Capacity	0.32	0.36	0.02	0.12
Queue Length 95th (m)	9.7	11.7	0.4	3.2
Control Delay (s)	48.5	35.3	0.6	3.3
Lane LOS	E	E	A	A
Approach Delay (s)	48.5	35.3	0.6	3.3
Approach LOS	E	E		

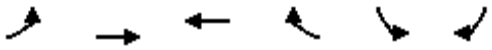
Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	28	376	213	8	11	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	409	232	9	12	34
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		166				
pX, platoon unblocked						
vC, conflicting volume	271				796	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	271				796	380
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	94
cM capacity (veh/h)	1258				321	587

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	439	240	46
Volume Left	30	0	12
Volume Right	0	9	34
cSH	1258	1700	482
Volume to Capacity	0.02	0.14	0.09
Queue Length 95th (m)	0.6	0.0	2.4
Control Delay (s)	0.8	0.0	13.3
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	13.3
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	15	352	241	7	21	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	383	262	8	23	14
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	319				829	448
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	319				829	448
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	97
cM capacity (veh/h)	1189				294	519

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	399	270	37
Volume Left	16	0	23
Volume Right	0	8	14
cSH	1189	1700	353
Volume to Capacity	0.01	0.16	0.10
Queue Length 95th (m)	0.3	0.0	2.6
Control Delay (s)	0.5	0.0	16.4
Lane LOS	A		C
Approach Delay (s)	0.5	0.0	16.4
Approach LOS			C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	0	0	0	0	34	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	37	221
Pedestrians	20					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	315	20			20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315	20			20	
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	100			98	
cM capacity (veh/h)	663	1058			1596	

Direction, Lane #	SB 1
Volume Total	258
Volume Left	37
Volume Right	0
cSH	1596
Volume to Capacity	0.02
Queue Length 95th (m)	0.5
Control Delay (s)	1.2
Lane LOS	A
Approach Delay (s)	1.2
Approach LOS	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

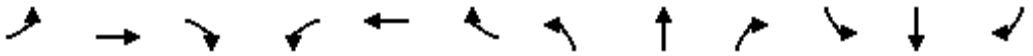
63: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.1	0.0	0.3	0.1	0.5
Delay / Veh (s)	1.3	0.5	5.9	8.0	2.5
Stop Delay (hr)	0.1	0.0	0.2	0.1	0.4
St Del/Veh (s)	0.7	0.1	4.6	7.1	1.7
Total Stops	13	1	77	26	117
Travel Dist (km)	49.3	15.5	14.8	2.7	82.5
Travel Time (hr)	1.4	0.4	0.7	0.2	2.7
Avg Speed (kph)	36	40	20	15	31
Fuel Used (l)	72.8	18.1	23.9	4.2	119.0
HC Emissions (g)	3	1	2	0	5
CO Emissions (g)	1080	288	482	34	1884
NOx Emissions (g)	10	2	5	0	17
Vehicles Entered	397	158	162	39	756
Vehicles Exited	399	158	162	39	758
Hourly Exit Rate	399	158	162	39	758
Input Volume	405	150	181	32	768
% of Volume	99	105	90	122	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	All
Total Delay (hr)	0.1	0.2	0.3	0.6
Delay / Veh (s)	1.8	2.0	16.5	3.3
Stop Delay (hr)	0.1	0.0	0.3	0.4
St Del/Veh (s)	1.1	0.5	14.5	2.1
Total Stops	21	14	67	102
Travel Dist (km)	22.0	23.6	8.7	54.3
Travel Time (hr)	0.8	0.9	0.5	2.2
Avg Speed (kph)	30	26	17	25
Fuel Used (l)	39.4	33.2	12.6	85.3
HC Emissions (g)	4	5	1	10
CO Emissions (g)	984	977	268	2229
NOx Emissions (g)	12	13	3	28
Vehicles Entered	288	329	65	682
Vehicles Exited	288	329	66	683
Hourly Exit Rate	288	329	66	683
Input Volume	295	390	69	754
% of Volume	98	84	96	91
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Scenario C 2020 PM with background traffic growth and development



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.92		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	0.97	1.00			0.97		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.96		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1493	1546			1432		1594	1606		1420	1415	
Flt Permitted	0.39	1.00			0.89		0.14	1.00		0.28	1.00	
Satd. Flow (perm)	605	1546			1280		240	1606		426	1415	
Volume (vph)	496	316	36	17	121	76	58	349	34	85	185	454
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	528	363	49	39	136	85	74	426	49	99	206	575
RTOR Reduction (vph)	0	7	0	0	24	0	0	6	0	0	139	0
Lane Group Flow (vph)	528	406	0	0	236	0	74	470	0	99	642	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	34.0	34.0			16.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)	36.0	36.0			18.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.50	0.50			0.25		0.39	0.39		0.39	0.39	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	475	773			320		93	625		166	550	
v/s Ratio Prot	c0.22	0.26						0.29			c0.45	
v/s Ratio Perm	c0.34				0.18		0.31			0.23		
v/c Ratio	1.11	0.52			0.74		0.80	0.75		0.60	1.17	
Uniform Delay, d1	16.5	12.2			24.8		19.5	19.0		17.5	22.0	
Progression Factor	1.00	1.00			1.19		1.00	1.00		0.85	0.71	
Incremental Delay, d2	75.4	2.5			14.1		49.1	8.1		13.8	92.2	
Delay (s)	91.9	14.7			43.6		68.6	27.1		28.7	107.9	
Level of Service	F	B			D		E	C		C	F	
Approach Delay (s)		58.1			43.6			32.7			99.0	
Approach LOS		E			D			C			F	

Intersection Summary			
HCM Average Control Delay	65.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.95			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1723			3637	1771	1485
Flt Permitted	1.00			0.61	0.95	1.00
Satd. Flow (perm)	1723			2231	1771	1485
Volume (vph)	688	133	81	587	249	388
Peak-hour factor, PHF	0.87	0.92	0.87	0.87	0.92	0.93
Adj. Flow (vph)	791	145	93	675	271	417
RTOR Reduction (vph)	8	0	0	0	0	100
Lane Group Flow (vph)	928	0	0	768	271	317
Confl. Peds. (#/hr)		75	75		9	3
Confl. Bikes (#/hr)		14				9
Heavy Vehicles (%)	1%	2%	0%	2%	1%	3%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	46.0			46.0	20.0	20.0
Effective Green, g (s)	49.0			49.0	23.0	23.0
Actuated g/C Ratio	0.61			0.61	0.29	0.29
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1055			1366	509	427
v/s Ratio Prot	c0.54				0.15	
v/s Ratio Perm				0.34		c0.21
v/c Ratio	0.88			0.56	0.53	0.74
Uniform Delay, d1	13.0			9.2	24.0	25.8
Progression Factor	0.95			1.00	1.26	1.39
Incremental Delay, d2	9.9			1.7	3.4	9.6
Delay (s)	22.2			10.8	33.7	45.4
Level of Service	C			B	C	D
Approach Delay (s)	22.2			10.8	40.8	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

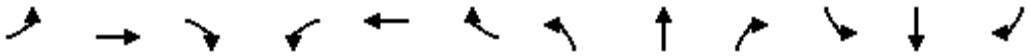
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	516	65	92	598	0	0
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	586	89	156	695	0	0
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.88		0.93	0.88
vC, conflicting volume			710		1328	669
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			672		1105	625
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			81		100	100
cM capacity (veh/h)			807		153	376

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	675	388	464
Volume Left	0	156	0
Volume Right	89	0	0
cSH	1700	807	1700
Volume to Capacity	0.40	0.19	0.27
Queue Length 95th (m)	0.0	5.4	0.0
Control Delay (s)	0.0	5.6	0.0
Lane LOS		A	
Approach Delay (s)	0.0	2.6	
Approach LOS			

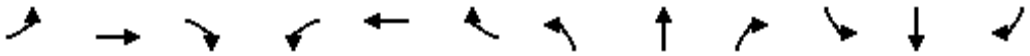
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	176	209	58	45	332	186	84	243	48	36	143	78
Peak Hour Factor	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Hourly flow rate (vph)	217	275	73	69	346	224	120	286	53	54	170	92

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	566	415	224	459	316
Volume Left (vph)	217	69	0	120	54
Volume Right (vph)	73	0	224	53	92
Hadj (s)	0.03	0.12	-0.67	0.02	-0.11
Departure Headway (s)	9.2	9.4	8.6	9.1	9.4
Degree Utilization, x	1.45	1.09	0.54	1.16	0.83
Capacity (veh/h)	398	390	405	399	378
Control Delay (s)	240.6	101.2	20.1	126.4	44.3
Approach Delay (s)	240.6	72.8		126.4	44.3
Approach LOS	F	F		F	E

Intersection Summary				
Delay	128.6			
HCM Level of Service	F			
Intersection Capacity Utilization	88.4%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1732	1498		1855	1355	1668	1799	
Flt Permitted		0.98			0.69	1.00		0.95	1.00	0.12	1.00	
Satd. Flow (perm)		1920			1216	1498		1770	1355	218	1799	
Volume (vph)	12	193	56	96	217	417	53	613	173	275	273	16
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	208	60	97	219	421	55	639	180	281	279	16
RTOR Reduction (vph)	0	12	0	0	0	229	0	0	99	0	3	0
Lane Group Flow (vph)	0	269	0	0	316	192	0	694	81	281	292	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.0			20.0	20.0		33.0	33.0	46.0	46.0	
Effective Green, g (s)		23.0			23.0	23.0		36.0	36.0	49.0	49.0	
Actuated g/C Ratio		0.29			0.29	0.29		0.45	0.45	0.61	0.61	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		552			350	431		797	610	297	1102	
v/s Ratio Prot										c0.11	0.16	
v/s Ratio Perm		0.14			c0.26	0.13		0.39	0.06	c0.47		
v/c Ratio		0.49			0.90	0.44		0.87	0.13	0.95	0.27	
Uniform Delay, d1		23.6			27.4	23.3		19.9	12.9	19.1	7.2	
Progression Factor		1.00			0.90	0.79		0.80	1.16	1.00	1.00	
Incremental Delay, d2		3.1			25.9	2.9		7.8	0.3	40.1	0.6	
Delay (s)		26.7			50.5	21.2		23.7	15.1	59.2	7.8	
Level of Service		C			D	C		C	B	E	A	
Approach Delay (s)		26.7			33.8			22.0			32.8	
Approach LOS		C			C			C			C	

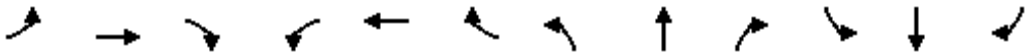
Intersection Summary			
HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.92			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1705	1710		1680	1892	1316		3050			3424	1386
Flt Permitted	0.31	1.00		0.30	1.00	1.00		0.77			0.60	1.00
Satd. Flow (perm)	558	1710		538	1892	1316		2382			2071	1386
Volume (vph)	86	257	97	87	439	75	124	478	167	64	235	51
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	112	317	143	102	453	95	170	525	226	107	264	60
RTOR Reduction (vph)	0	20	0	0	0	45	0	40	0	0	0	30
Lane Group Flow (vph)	112	440	0	102	453	50	0	882	0	0	371	30
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	223	684		215	757	526		1191			1036	693
v/s Ratio Prot		c0.26			0.24							
v/s Ratio Perm	0.20			0.19		0.04		c0.37			0.18	0.02
v/c Ratio	0.50	0.64		0.47	0.60	0.10		0.74			0.36	0.04
Uniform Delay, d1	18.0	19.4		17.8	18.9	15.0		15.9			12.2	10.2
Progression Factor	1.01	1.01		1.00	1.00	1.00		0.88			0.90	0.86
Incremental Delay, d2	7.8	4.6		7.3	3.5	0.4		3.7			0.9	0.1
Delay (s)	26.0	24.2		25.1	22.4	15.3		17.6			11.9	8.9
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		24.5			21.8			17.6			11.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

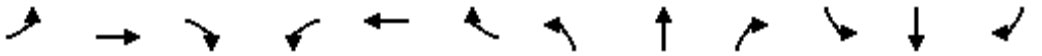
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	27	0	13	162	0	43	0	36	38	81	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	29	0	14	176	0	47	0	39	41	88	68
Pedestrians		45			51			36			74	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	525	434	203	420	448	145	202			90		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	525	434	203	420	448	145	202			90		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	93	100	97	60	100	96			97		
cM capacity (veh/h)	257	444	780	428	436	809	1318			1439		

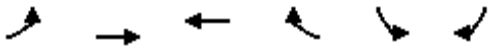
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	190	86	198
Volume Left	0	14	47	41
Volume Right	0	0	39	68
cSH	444	435	1318	1439
Volume to Capacity	0.07	0.44	0.04	0.03
Queue Length 95th (m)	1.6	16.5	0.8	0.7
Control Delay (s)	13.7	19.5	4.4	1.8
Lane LOS	B	C	A	A
Approach Delay (s)	13.7	19.5	4.4	1.8
Approach LOS	B	C		

Intersection Summary			
Average Delay	9.6		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.87		1.00	1.00	0.56
Flpb, ped/bikes	0.83	1.00	1.00		0.96	1.00	0.79	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1344	1448	354		1532	684	1370	1546		1723	1739	855
Flt Permitted	0.36	1.00	1.00		0.93	1.00	0.51	1.00		0.19	1.00	1.00
Satd. Flow (perm)	514	1448	354		1439	684	734	1546		353	1739	855
Volume (vph)	78	244	61	31	230	127	121	612	107	78	306	70
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	84	274	73	40	307	149	146	644	134	100	340	84
RTOR Reduction (vph)	0	0	49	0	0	21	0	4	0	0	0	0
Lane Group Flow (vph)	84	274	24	0	347	128	146	774	0	100	340	84
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	23.0	23.0	23.0		23.0	23.0	43.0	43.0		43.0	43.0	43.0
Effective Green, g (s)	26.0	26.0	26.0		26.0	26.0	46.0	46.0		46.0	46.0	46.0
Actuated g/C Ratio	0.32	0.32	0.32		0.32	0.32	0.57	0.57		0.57	0.57	0.57
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	167	471	115		468	222	422	889		203	1000	492
v/s Ratio Prot		0.19						c0.50			0.20	
v/s Ratio Perm	0.16		0.07		c0.24	0.19	0.20			0.28		0.10
v/c Ratio	0.50	0.58	0.21		0.74	0.58	0.35	0.87		0.49	0.34	0.17
Uniform Delay, d1	21.8	22.5	19.5		24.0	22.4	9.0	14.5		10.1	9.0	8.0
Progression Factor	0.99	1.00	1.31		0.72	0.66	1.14	1.22		0.78	0.75	0.73
Incremental Delay, d2	9.5	4.7	3.7		9.7	10.0	2.1	10.9		7.9	0.9	0.7
Delay (s)	31.1	27.1	29.3		27.0	24.7	12.4	28.5		15.8	7.6	6.6
Level of Service	C	C	C		C	C	B	C		B	A	A
Approach Delay (s)		28.2			26.3			26.0			9.0	
Approach LOS		C			C			C			A	

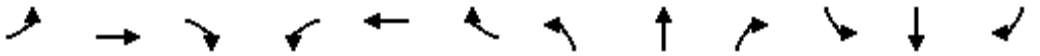
Intersection Summary			
HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	18	358	526	8	26	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	389	572	9	28	46
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	664				1091	660
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	664				1091	660
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				87	89
cM capacity (veh/h)	858				215	430

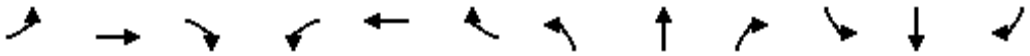
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	580	74
Volume Left	20	0	28
Volume Right	0	9	46
cSH	858	1700	311
Volume to Capacity	0.02	0.34	0.24
Queue Length 95th (m)	0.5	0.0	6.9
Control Delay (s)	0.7	0.0	20.2
Lane LOS	A		C
Approach Delay (s)	0.7	0.0	20.2
Approach LOS			C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						1.00	
Frpb, ped/bikes		0.84		1.00	1.00						0.75	
Flpb, ped/bikes		1.00		0.66	1.00						0.91	
Frt		0.98		1.00	1.00						0.95	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1247		1044	1598						1374	
Flt Permitted		1.00		0.46	1.00						0.99	
Satd. Flow (perm)		1247		501	1598						1374	
Volume (vph)	0	302	44	43	353	0	0	0	0	12	76	74
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	0	336	71	77	401	0	0	0	0	31	112	92
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	398	0	77	401	0	0	0	0	0	226	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		44.0		44.0	44.0						24.0	
Effective Green, g (s)		46.0		46.0	46.0						26.0	
Actuated g/C Ratio		0.57		0.57	0.57						0.32	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Lane Grp Cap (vph)		717		288	919						447	
v/s Ratio Prot		c0.32			0.25							
v/s Ratio Perm				0.15							0.16	
v/c Ratio		0.55		0.27	0.44						0.51	
Uniform Delay, d1		10.6		8.5	9.6						21.8	
Progression Factor		0.96		0.72	0.77						1.00	
Incremental Delay, d2		2.4		1.5	1.0						4.0	
Delay (s)		12.6		7.7	8.4						25.8	
Level of Service		B		A	A						C	
Approach Delay (s)		12.6			8.3			0.0			25.8	
Approach LOS		B			A			A			C	

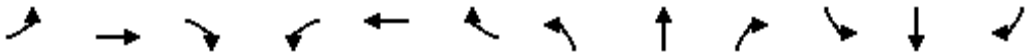
Intersection Summary			
HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	51	54	7	12	163	79	17	37	20	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)	55	59	8	13	177	86	18	40	22	0	0	0
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	406	233	123	232	222	178	75			121		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	406	233	123	232	222	178	75			121		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	90	99	98	70	90	99			100		
cM capacity (veh/h)	326	585	833	546	593	821	1426			1392		

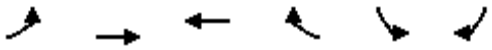
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	122	276	80
Volume Left	55	13	18
Volume Right	8	86	22
cSH	436	647	1426
Volume to Capacity	0.28	0.43	0.01
Queue Length 95th (m)	8.6	16.2	0.3
Control Delay (s)	16.4	14.7	1.8
Lane LOS	C	B	A
Approach Delay (s)	16.4	14.7	1.8
Approach LOS	C	B	

Intersection Summary				
Average Delay	12.9			
Intersection Capacity Utilization	46.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.85		1.00	0.94		1.00	0.78			0.83	
Flpb, ped/bikes		0.96		0.63	1.00		1.00	1.00			1.00	
Frt		0.97		1.00	0.99		1.00	0.92			0.96	
Flt Protected		0.99		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)		2329		1066	1479		1635	1357			1490	
Flt Permitted		0.86		0.47	1.00		0.42	1.00			0.44	
Satd. Flow (perm)		2017		524	1479		725	1357			660	
Volume (vph)	55	286	62	152	287	26	167	298	321	47	226	100
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	60	304	85	217	334	28	232	324	345	51	246	109
RTOR Reduction (vph)	0	26	0	0	4	0	0	27	0	0	17	0
Lane Group Flow (vph)	0	424	0	217	358	0	232	642	0	0	389	0
Confl. Peds. (#/hr)	436		420	420		436	271		340	340		271
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		38.0		38.0	38.0		30.0	30.0			30.0	
Effective Green, g (s)		40.0		40.0	40.0		32.0	32.0			32.0	
Actuated g/C Ratio		0.50		0.50	0.50		0.40	0.40			0.40	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1009		262	740		290	543			264	
v/s Ratio Prot					0.24			0.47				
v/s Ratio Perm		0.21		c0.41			0.32				c0.59	
v/c Ratio		0.42		0.83	0.48		0.80	1.18			1.47	
Uniform Delay, d1		12.7		17.1	13.2		21.2	24.0			24.0	
Progression Factor		0.95		1.00	1.00		1.00	1.00			1.04	
Incremental Delay, d2		1.2		25.0	2.3		20.3	99.7			231.9	
Delay (s)		13.2		42.1	15.4		41.4	123.7			256.9	
Level of Service		B		D	B		D	F			F	
Approach Delay (s)		13.2			25.4			102.5			256.9	
Approach LOS		B			C			F			F	

Intersection Summary			
HCM Average Control Delay	93.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Volume (veh/h)	323	354	361	165	30	129
Peak Hour Factor	0.94	0.91	0.85	0.96	0.92	0.92
Hourly flow rate (vph)	344	389	425	172	33	140
Pedestrians		16	33		435	
Lane Width (m)		3.0	3.0		4.8	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		1	2		48	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	1032				1969	876
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1032				1969	876
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	0				0	21
cM capacity (veh/h)	342				0	177

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	344	389	425	172	173
Volume Left	344	0	0	0	33
Volume Right	0	0	0	172	140
cSH	342	1700	1700	1700	0
Volume to Capacity	1.00	0.23	0.25	0.10	Err
Queue Length 95th (m)	87.0	0.0	0.0	0.0	Err
Control Delay (s)	85.6	0.0	0.0	0.0	Err
Lane LOS	F				F
Approach Delay (s)	40.1		0.0		Err
Approach LOS					F

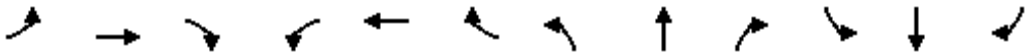
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	398	82	38	365	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	433	89	41	397	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.87		0.93	0.87
vC, conflicting volume			522		1257	477
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			449		1084	397
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			964		169	566

Direction, Lane #	EB 1	WB 1
Volume Total	522	438
Volume Left	0	41
Volume Right	89	0
cSH	1700	964
Volume to Capacity	0.31	0.04
Queue Length 95th (m)	0.0	1.0
Control Delay (s)	0.0	1.3
Lane LOS		A
Approach Delay (s)	0.0	1.3
Approach LOS		

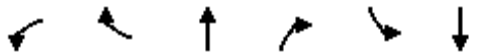
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	27	0	16	249	0	52	0	0	0	31	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	29	0	17	271	0	57	0	0	0	34	87
Pedestrians		28			32			60			84	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	438	250	165	297	294	116	149			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	438	250	165	297	294	116	149			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	100	97	52	100	96			100		
cM capacity (veh/h)	280	595	814	542	562	845	1398			1537		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	288	57	121
Volume Left	0	17	57	0
Volume Right	0	0	0	87
cSH	595	561	1398	1537
Volume to Capacity	0.05	0.51	0.04	0.00
Queue Length 95th (m)	1.2	22.2	1.0	0.0
Control Delay (s)	11.4	18.0	7.7	0.0
Lane LOS	B	C	A	
Approach Delay (s)	11.4	18.0	7.7	0.0
Approach LOS	B	C		

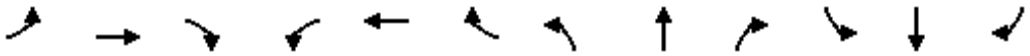
Intersection Summary				
Average Delay	12.0			
Intersection Capacity Utilization	39.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	60	377	536	0	28	284
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	410	583	0	30	309
Pedestrians	52		163			169
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.84	0.83			0.83	
vC, conflicting volume	1167	804			635	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1140	763			558	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	56	0			96	
cM capacity (veh/h)	148	274			801	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	475	583	339
Volume Left	65	0	30
Volume Right	410	0	0
cSH	245	1700	801
Volume to Capacity	1.94	0.34	0.04
Queue Length 95th (m)	258.2	0.0	0.9
Control Delay (s)	470.2	0.0	1.3
Lane LOS	F		A
Approach Delay (s)	470.2	0.0	1.3
Approach LOS	F		

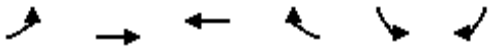
Intersection Summary			
Average Delay	160.2		
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	33	47	0	40	74	175	54	484	87	134	176	126
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)	36	51	0	43	80	190	59	526	95	146	191	137
Pedestrians		94			157			19			78	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			13			2			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	0.98	0.98	0.98	0.98	0.98		0.98					
vC, conflicting volume	1644	1540	373	1443	1561	808	422			778		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1657	1551	361	1452	1572	808	411			778		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	24	100	0	0	38	94			80		
cM capacity (veh/h)	0	67	607	25	65	308	1035			726		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	87	314	679	474
Volume Left	36	43	59	146
Volume Right	0	190	95	137
cSH	0	87	1035	726
Volume to Capacity	Err	3.62	0.06	0.20
Queue Length 95th (m)	Err	Err	1.4	5.7
Control Delay (s)	Err	Err	1.5	5.4
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	1.5	5.4
Approach LOS	F	F		

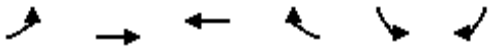
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	51	409	471	8	23	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	445	512	9	25	60
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		168				
pX, platoon unblocked						
vC, conflicting volume	552				1163	660
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	552				1163	660
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				87	85
cM capacity (veh/h)	991				188	407

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	500	521	85
Volume Left	55	0	25
Volume Right	0	9	60
cSH	991	1700	303
Volume to Capacity	0.06	0.31	0.28
Queue Length 95th (m)	1.3	0.0	8.5
Control Delay (s)	1.6	0.0	21.5
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	21.5
Approach LOS			C

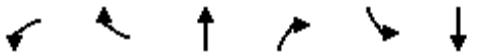
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	55	344	475	16	52	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	374	516	17	57	21
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	583				1166	707
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583				1166	707
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				68	94
cM capacity (veh/h)	950				176	370

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	434	534	77
Volume Left	60	0	57
Volume Right	0	17	21
cSH	950	1700	205
Volume to Capacity	0.06	0.31	0.38
Queue Length 95th (m)	1.5	0.0	12.5
Control Delay (s)	1.9	0.0	32.9
Lane LOS	A		D
Approach Delay (s)	1.9	0.0	32.9
Approach LOS			D

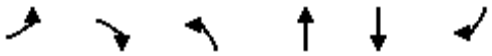
Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	0	0	0	0	141	233
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	153	253
Pedestrians	102					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	662	102			102	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	662	102			102	
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	100			90	
cM capacity (veh/h)	383	953			1490	

Direction, Lane #	SB 1
Volume Total	407
Volume Left	153
Volume Right	0
cSH	1490
Volume to Capacity	0.10
Queue Length 95th (m)	2.6
Control Delay (s)	3.5
Lane LOS	A
Approach Delay (s)	3.5
Approach LOS	

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	0	0	42	374	140	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	46	407	152	70
Pedestrians	141					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	826	328	363			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826	328	363			
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	100	96			
cM capacity (veh/h)	329	713	1196			

Direction, Lane #	NB 1	SB 1
Volume Total	452	222
Volume Left	46	0
Volume Right	0	70
cSH	1196	1700
Volume to Capacity	0.04	0.13
Queue Length 95th (m)	0.9	0.0
Control Delay (s)	1.2	0.0
Lane LOS	A	
Approach Delay (s)	1.2	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	30	28	362	0	0	342
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	30	393	0	0	372
Pedestrians			75			81
Lane Width (m)			3.7			3.7
Walking Speed (m/s)			1.2			1.2
Percent Blockage			6			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			58			237
pX, platoon unblocked						
vC, conflicting volume	840	474			393	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	840	474			393	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	94			100	
cM capacity (veh/h)	314	549			1165	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	63	393	372
Volume Left	33	0	0
Volume Right	30	0	0
cSH	396	1700	1700
Volume to Capacity	0.16	0.23	0.22
Queue Length 95th (m)	4.3	0.0	0.0
Control Delay (s)	15.8	0.0	0.0
Lane LOS	C		
Approach Delay (s)	15.8	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

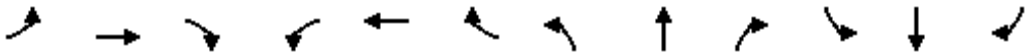
91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	All
Total Delay (hr)	0.6	0.4	3.6	4.6
Delay / Veh (s)	6.6	3.2	77.8	17.0
Stop Delay (hr)	0.5	0.1	3.5	4.1
St Del/Veh (s)	5.1	1.1	75.9	15.1
Total Stops	78	50	185	313
Travel Dist (km)	26.2	35.4	21.9	83.5
Travel Time (hr)	1.4	1.4	4.2	7.0
Avg Speed (kph)	20	25	5	12
Fuel Used (l)	46.6	50.7	55.4	152.7
HC Emissions (g)	8	5	1	13
CO Emissions (g)	1617	1102	315	3033
NOx Emissions (g)	22	14	3	38
Vehicles Entered	346	468	169	983
Vehicles Exited	347	468	164	979
Hourly Exit Rate	347	468	164	979
Input Volume	351	554	172	1077
% of Volume	99	85	95	91
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

174: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.7	0.1	3.8	1.4	5.9
Delay / Veh (s)	7.7	0.8	66.2	35.2	22.3
Stop Delay (hr)	0.6	0.0	3.8	1.3	5.7
St Del/Veh (s)	6.2	0.1	64.9	34.8	21.3
Total Stops	65	0	202	115	382
Travel Dist (km)	40.2	28.5	23.6	9.3	101.6
Travel Time (hr)	1.7	0.7	4.5	1.7	8.7
Avg Speed (kph)	24	41	6	6	12
Fuel Used (l)	60.2	23.0	57.2	23.0	163.5
HC Emissions (g)	2	1	1	0	5
CO Emissions (g)	833	257	403	139	1632
NOx Emissions (g)	8	3	3	2	16
Vehicles Entered	328	284	210	141	963
Vehicles Exited	326	284	205	138	953
Hourly Exit Rate	326	284	205	138	953
Input Volume	340	397	231	138	1106
% of Volume	96	72	89	100	86
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	1	0	1

Scenario D 2020 AM with background traffic growth and development



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.90	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1462	1608			1517		1626	1625		1472	1497	
Flt Permitted	0.61	1.00			0.89		0.11	1.00		0.58	1.00	
Satd. Flow (perm)	933	1608			1362		190	1625		901	1497	
Volume (vph)	262	347	37	7	36	34	9	165	25	224	281	508
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	288	369	53	18	42	41	18	206	36	238	339	591
RTOR Reduction (vph)	0	7	0	0	31	0	0	9	0	0	87	0
Lane Group Flow (vph)	288	415	0	0	70	0	18	234	0	238	843	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.0	26.0			16.0		34.0	34.0		34.0	34.0	
Effective Green, g (s)	28.0	28.0			18.0		36.0	36.0		36.0	36.0	
Actuated g/C Ratio	0.39	0.39			0.25		0.50	0.50		0.50	0.50	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	407	625			341		95	813		451	749	
v/s Ratio Prot	0.06	c0.26						0.14			c0.56	
v/s Ratio Perm	c0.22				0.05		0.09			0.26		
v/c Ratio	0.71	0.66			0.21		0.19	0.29		0.53	1.13	
Uniform Delay, d1	19.4	18.1			21.3		9.9	10.5		12.2	18.0	
Progression Factor	1.00	1.00			1.43		1.05	1.06		0.91	0.72	
Incremental Delay, d2	10.0	5.5			1.4		4.4	0.9		3.4	69.9	
Delay (s)	29.3	23.6			31.9		14.8	12.0		14.5	83.0	
Level of Service	C	C			C		B	B		B	F	
Approach Delay (s)		25.9			31.9			12.2			69.0	
Approach LOS		C			C			B			E	

Intersection Summary			
HCM Average Control Delay	47.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.94			1.00	1.00	0.95
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1667			3605	1789	1528
Flt Permitted	1.00			0.56	0.95	1.00
Satd. Flow (perm)	1667			2057	1789	1528
Volume (vph)	561	199	152	424	97	152
Peak-hour factor, PHF	0.91	0.82	0.87	0.82	0.85	0.88
Adj. Flow (vph)	616	243	175	517	114	173
RTOR Reduction (vph)	18	0	0	0	0	138
Lane Group Flow (vph)	841	0	0	692	114	35
Confl. Peds. (#/hr)		44	44		4	5
Confl. Bikes (#/hr)		31				2
Heavy Vehicles (%)	2%	1%	2%	2%	0%	0%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	53.0			53.0	13.0	13.0
Effective Green, g (s)	56.0			56.0	16.0	16.0
Actuated g/C Ratio	0.70			0.70	0.20	0.20
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1167			1440	358	306
v/s Ratio Prot	c0.50				c0.06	
v/s Ratio Perm				0.34		0.02
v/c Ratio	0.72			0.48	0.32	0.11
Uniform Delay, d1	7.3			5.4	27.3	26.2
Progression Factor	1.29			1.00	1.08	1.43
Incremental Delay, d2	3.2			1.2	2.3	0.7
Delay (s)	12.5			6.6	31.9	38.3
Level of Service	B			A	C	D
Approach Delay (s)	12.5			6.6	35.8	
Approach LOS	B			A	D	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

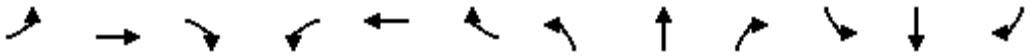
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	848	170	131	425	0	0
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	874	175	149	483	0	0
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.72		0.75	0.72
vC, conflicting volume			1084		1538	1005
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1117		1533	1007
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			67		100	100
cM capacity (veh/h)			449		53	171

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	1049	310	322
Volume Left	0	149	0
Volume Right	175	0	0
cSH	1700	449	1700
Volume to Capacity	0.62	0.33	0.19
Queue Length 95th (m)	0.0	10.9	0.0
Control Delay (s)	0.0	11.4	0.0
Lane LOS		B	
Approach Delay (s)	0.0	5.6	
Approach LOS			

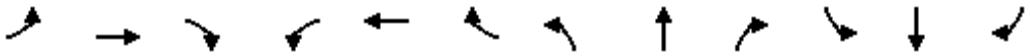
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	101	225	50	44	141	47	36	141	54	148	180	45
Peak Hour Factor	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Hourly flow rate (vph)	104	232	52	47	150	50	40	158	61	156	189	47

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	388	197	50	260	393
Volume Left (vph)	104	47	0	40	156
Volume Right (vph)	52	0	50	61	47
Hadj (s)	0.01	0.15	-0.67	-0.08	0.04
Departure Headway (s)	7.1	8.1	7.2	7.3	7.0
Degree Utilization, x	0.77	0.44	0.10	0.53	0.76
Capacity (veh/h)	481	391	421	434	486
Control Delay (s)	29.9	16.1	9.8	18.2	29.2
Approach Delay (s)	29.9	14.9		18.2	29.2
Approach LOS	D	B		C	D

Intersection Summary				
Delay	24.5			
HCM Level of Service	C			
Intersection Capacity Utilization	83.2%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.96		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2002			1715	1545		1857	1350	1639	1812	
Flt Permitted		0.98			0.64	1.00		0.96	1.00	0.34	1.00	
Satd. Flow (perm)		1968			1119	1545		1790	1350	587	1812	
Volume (vph)	11	218	39	109	166	140	17	257	115	488	351	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	237	42	115	175	147	19	286	128	530	382	7
RTOR Reduction (vph)	0	8	0	0	0	101	0	0	90	0	1	0
Lane Group Flow (vph)	0	283	0	0	290	46	0	305	38	530	388	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		21.0	21.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		24.0	24.0	47.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.30	0.30	0.59	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		615			350	483		537	405	595	1065	
v/s Ratio Prot										c0.21	0.21	
v/s Ratio Perm		0.14			c0.26	0.03		0.17	0.03	c0.31		
v/c Ratio		0.46			0.83	0.10		0.57	0.09	0.89	0.36	
Uniform Delay, d1		22.1			25.5	19.5		23.6	20.2	11.8	8.7	
Progression Factor		1.00			0.87	0.55		0.93	1.37	1.00	1.00	
Incremental Delay, d2		2.5			18.3	0.4		3.5	0.4	18.0	1.0	
Delay (s)		24.6			40.4	11.0		25.4	28.0	29.9	9.6	
Level of Service		C			D	B		C	C	C	A	
Approach Delay (s)		24.6			30.5			26.2			21.3	
Approach LOS		C			C			C			C	

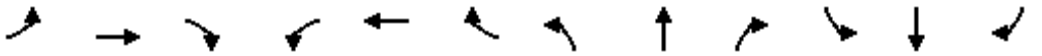
Intersection Summary			
HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1592	1659		1681	1874	1369		3215			3486	1527
Flt Permitted	0.57	1.00		0.30	1.00	1.00		0.66			0.66	1.00
Satd. Flow (perm)	958	1659		538	1874	1369		2156			2338	1527
Volume (vph)	40	212	188	58	186	35	97	316	105	106	373	44
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	252	219	66	221	49	156	395	114	129	455	81
RTOR Reduction (vph)	0	39	0	0	0	29	0	22	0	0	0	42
Lane Group Flow (vph)	49	432	0	66	221	20	0	643	0	0	584	39
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	395	684		222	773	565		1051			1140	744
v/s Ratio Prot		c0.26			0.12							
v/s Ratio Perm	0.05			0.12		0.01		c0.30			0.25	0.03
v/c Ratio	0.12	0.63		0.30	0.29	0.04		0.61			0.51	0.05
Uniform Delay, d1	14.6	18.7		15.7	15.7	14.0		15.0			14.0	10.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.65			0.84	0.59
Incremental Delay, d2	0.6	4.4		3.4	0.9	0.1		2.4			1.5	0.1
Delay (s)	15.2	23.1		19.1	16.6	14.1		12.2			13.4	6.5
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		22.4			16.7			12.2			12.5	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.89		1.00	1.00	0.68
Flpb, ped/bikes	0.76	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1209	1564	545		1316	802	1658	1571		1790	1773	1021
Flt Permitted	0.54	1.00	1.00		0.91	1.00	0.37	1.00		0.30	1.00	1.00
Satd. Flow (perm)	688	1564	545		1211	802	641	1571		569	1773	1021
Volume (vph)	79	206	97	35	175	75	53	408	72	67	411	49
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	130	245	117	41	194	90	73	469	104	100	489	53
RTOR Reduction (vph)	0	0	73	0	0	56	0	10	0	0	0	17
Lane Group Flow (vph)	130	245	44	0	235	34	73	563	0	100	489	36
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	27.0	27.0	27.0		27.0	27.0	39.0	39.0		39.0	39.0	39.0
Effective Green, g (s)	30.0	30.0	30.0		30.0	30.0	42.0	42.0		42.0	42.0	42.0
Actuated g/C Ratio	0.38	0.38	0.38		0.38	0.38	0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	258	587	204		454	301	337	825		299	931	536
v/s Ratio Prot		0.16						c0.36			0.28	
v/s Ratio Perm	0.19		0.08		c0.19	0.04	0.11			0.18		0.04
v/c Ratio	0.50	0.42	0.22		0.52	0.11	0.22	0.68		0.33	0.53	0.07
Uniform Delay, d1	19.3	18.5	17.0		19.4	16.3	10.2	14.1		10.9	12.5	9.4
Progression Factor	1.00	1.00	1.00		0.71	0.30	1.12	1.27		0.75	0.77	0.61
Incremental Delay, d2	6.9	2.2	2.4		4.1	0.7	1.4	4.3		2.8	2.0	0.2
Delay (s)	26.1	20.7	19.4		17.8	5.6	12.8	22.2		11.0	11.6	5.9
Level of Service	C	C	B		B	A	B	C		B	B	A
Approach Delay (s)		21.8			14.4			21.2			11.1	
Approach LOS		C			B			C			B	

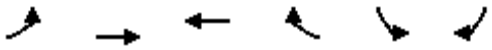
Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	34	99	426	0	18	488
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	108	463	0	20	530
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.91	0.87			0.87	
vC, conflicting volume	1239	620			535	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1052	564			467	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	73			98	
cM capacity (veh/h)	186	398			896	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	145	463	550
Volume Left	37	0	20
Volume Right	108	0	0
cSH	308	1700	896
Volume to Capacity	0.47	0.27	0.02
Queue Length 95th (m)	18.1	0.0	0.5
Control Delay (s)	26.6	0.0	0.6
Lane LOS	D		A
Approach Delay (s)	26.6	0.0	0.6
Approach LOS	D		

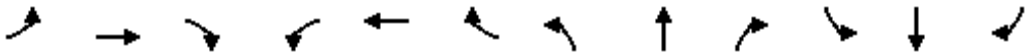
Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	9	363	234	5	20	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	395	254	5	22	28
Pedestrians		1	3		80	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	340				754	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	340				754	338
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	96
cM capacity (veh/h)	1136				347	655

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	404	260	50
Volume Left	10	0	22
Volume Right	0	5	28
cSH	1136	1700	473
Volume to Capacity	0.01	0.15	0.11
Queue Length 95th (m)	0.2	0.0	2.7
Control Delay (s)	0.3	0.0	13.5
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	13.5
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		0.90			1.00						0.81	
Flpb, ped/bikes		1.00			1.00						0.92	
Frt		0.98			1.00						0.95	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1408			1364						1518	
Flt Permitted		1.00			1.00						0.99	
Satd. Flow (perm)		1408			1364						1518	
Volume (vph)	0	275	47	0	220	0	0	0	0	25	84	57
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	0	327	64	0	256	0	0	0	0	33	109	79
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	382	0	0	256	0	0	0	0	0	196	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type										Perm		
Protected Phases		4			8						6	
Permitted Phases										6		
Actuated Green, G (s)		43.0			43.0						25.0	
Effective Green, g (s)		45.0			45.0						27.0	
Actuated g/C Ratio		0.56			0.56						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		792			767						512	
v/s Ratio Prot		c0.27			0.19							
v/s Ratio Perm											0.13	
v/c Ratio		0.48			0.33						0.38	
Uniform Delay, d1		10.5			9.4						20.2	
Progression Factor		0.73			0.82						0.93	
Incremental Delay, d2		1.9			1.1						2.0	
Delay (s)		9.6			8.8						20.9	
Level of Service		A			A						C	
Approach Delay (s)		9.6			8.8			0.0			20.9	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



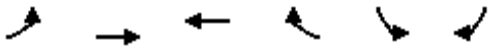
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	46	17	129	0	0	425
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	18	140	0	0	462
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			61			237
pX, platoon unblocked						
vC, conflicting volume	647	186			161	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	647	186			161	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	98			100	
cM capacity (veh/h)	419	823			1392	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	140	462
Volume Left	50	0	0
Volume Right	18	0	0
cSH	483	1700	1700
Volume to Capacity	0.14	0.08	0.27
Queue Length 95th (m)	3.7	0.0	0.0
Control Delay (s)	13.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.7	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.86		1.00	0.98		1.00	0.81			0.89	
Flpb, ped/bikes	0.60	1.00		0.76	1.00		1.00	1.00			0.98	
Frt	1.00	0.97		1.00	0.99		1.00	0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1023	1330		1261	1398		1503	1386			1785	
Flt Permitted	0.57	1.00		0.47	1.00		0.35	1.00			0.92	
Satd. Flow (perm)	612	1330		620	1398		550	1386			1650	
Volume (vph)	32	219	64	152	216	7	46	112	140	36	279	111
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	53	274	83	192	240	9	55	126	184	65	317	139
RTOR Reduction (vph)	0	14	0	0	2	0	0	66	0	0	16	0
Lane Group Flow (vph)	53	344	0	192	248	0	55	244	0	0	505	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	38.0	38.0		38.0	38.0		30.0	30.0			30.0	
Effective Green, g (s)	40.0	40.0		40.0	40.0		32.0	32.0			32.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.40	0.40			0.40	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	306	665		310	699		220	554			660	
v/s Ratio Prot		0.26			0.18			0.18				
v/s Ratio Perm	0.09			c0.31			0.10				c0.31	
v/c Ratio	0.17	0.52		0.62	0.35		0.25	0.44			0.76	
Uniform Delay, d1	10.9	13.5		14.5	12.2		16.0	17.5			20.7	
Progression Factor	0.92	0.80		1.00	1.00		1.00	1.00			1.19	
Incremental Delay, d2	1.2	2.7		9.0	1.4		2.7	2.5			7.3	
Delay (s)	11.3	13.5		23.5	13.6		18.7	20.0			32.0	
Level of Service	B	B		C	B		B	C			C	
Approach Delay (s)		13.2			17.9			19.8			32.0	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Volume (veh/h)	145	212	209	31	61	150
Peak Hour Factor	0.85	0.78	0.90	0.88	1.00	0.93
Hourly flow rate (vph)	171	272	232	35	61	161
Pedestrians		37	65		330	
Lane Width (m)		3.0	3.0		4.8	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		3	5		37	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	597				1240	599
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	597				1240	599
tC, single (s)	4.1				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	72				33	48
cM capacity (veh/h)	614				91	310

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	171	272	232	35	222
Volume Left	171	0	0	0	61
Volume Right	0	0	0	35	161
cSH	614	1700	1700	1700	187
Volume to Capacity	0.28	0.16	0.14	0.02	1.19
Queue Length 95th (m)	8.6	0.0	0.0	0.0	88.3
Control Delay (s)	13.1	0.0	0.0	0.0	177.5
Lane LOS	B				F
Approach Delay (s)	5.1		0.0		177.5
Approach LOS					F

Intersection Summary			
Average Delay	44.7		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

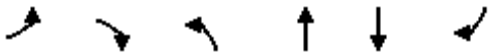
* User Entered Value



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	335	50	36	231	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	364	54	39	251	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.91		0.93	0.91
vC, conflicting volume			418		1021	391
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			361		947	331
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			1090		206	647

Direction, Lane #	EB 1	WB 1
Volume Total	418	290
Volume Left	0	39
Volume Right	54	0
cSH	1700	1090
Volume to Capacity	0.25	0.04
Queue Length 95th (m)	0.0	0.8
Control Delay (s)	0.0	1.4
Lane LOS		A
Approach Delay (s)	0.0	1.4
Approach LOS		

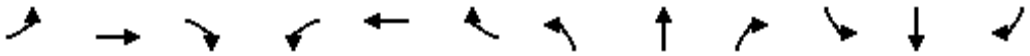
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	0	0	17	94	142	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	18	102	154	23
Pedestrians	24					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	329	190	201			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	329	190	201			
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	100	99			
cM capacity (veh/h)	657	852	1371			

Direction, Lane #	NB 1	SB 1
Volume Total	121	177
Volume Left	18	0
Volume Right	0	23
cSH	1371	1700
Volume to Capacity	0.01	0.10
Queue Length 95th (m)	0.3	0.0
Control Delay (s)	1.3	0.0
Lane LOS	A	
Approach Delay (s)	1.3	0.0
Approach LOS		

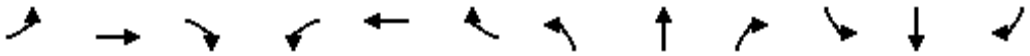
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	14	0	8	59	0	16	0	18	35	29	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	0	9	64	0	17	0	20	38	32	30
Pedestrians		75			31			31			28	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	302	283	153	237	289	69	137			51		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302	283	153	237	289	69	137			51		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	97	100	99	88	100	99			97		
cM capacity (veh/h)	490	549	814	603	545	945	1354			1515		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	73	37	100
Volume Left	0	9	17	38
Volume Right	0	0	20	30
cSH	549	551	1354	1515
Volume to Capacity	0.03	0.13	0.01	0.03
Queue Length 95th (m)	0.6	3.4	0.3	0.6
Control Delay (s)	11.8	12.5	3.7	2.9
Lane LOS	B	B	A	A
Approach Delay (s)	11.8	12.5	3.7	2.9
Approach LOS	B	B		

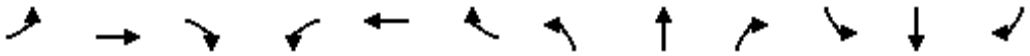
Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	31.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	29	42	10	6	55	45	7	22	3	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)	32	46	11	7	60	49	8	24	3	0	0	0
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	178	126	90	150	125	70	49			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	126	90	150	125	70	49			62		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	94	99	99	92	95	99			100		
cM capacity (veh/h)	624	706	895	677	708	956	1492			1495		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	88	115	35	0
Volume Left	32	7	8	0
Volume Right	11	49	3	0
cSH	692	793	1492	1700
Volume to Capacity	0.13	0.15	0.01	0.00
Queue Length 95th (m)	3.3	3.9	0.1	0.0
Control Delay (s)	11.0	10.3	1.7	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.0	10.3	1.7	0.0
Approach LOS	B	B		

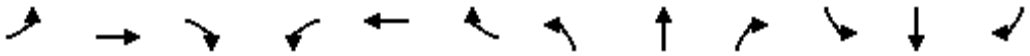
Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	30.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	14	0	4	89	0	6	0	0	0	55	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	0	4	97	0	7	0	0	0	60	34
Pedestrians		90			18			48			50	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	278	198	215	163	215	68	183			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	278	198	215	163	215	68	183			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	100	99	84	100	99			100		
cM capacity (veh/h)	487	631	730	689	618	938	1284			1574		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	101	7	93
Volume Left	0	4	7	0
Volume Right	0	0	0	34
cSH	631	620	1284	1574
Volume to Capacity	0.02	0.16	0.01	0.00
Queue Length 95th (m)	0.6	4.4	0.1	0.0
Control Delay (s)	10.8	11.9	7.8	0.0
Lane LOS	B	B	A	
Approach Delay (s)	10.8	11.9	7.8	0.0
Approach LOS	B	B		

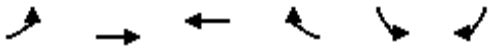
Intersection Summary				
Average Delay	6.6			
Intersection Capacity Utilization	32.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	23	9	6	19	13	29	15	236	30	107	234	56
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)	25	10	7	21	14	32	16	257	33	116	254	61
Pedestrians		85			165			17			83	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		7			14			1			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	1029	1089	387	1016	1103	521	400			454		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1029	1089	387	1016	1103	521	400			454		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	93	99	84	90	93	98			88		
cM capacity (veh/h)	120	148	604	131	145	443	1074			950		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	41	66	305	432
Volume Left	25	21	16	116
Volume Right	7	32	33	61
cSH	144	203	1074	950
Volume to Capacity	0.29	0.33	0.02	0.12
Queue Length 95th (m)	8.4	10.2	0.4	3.2
Control Delay (s)	39.6	31.1	0.6	3.5
Lane LOS	E	D	A	A
Approach Delay (s)	39.6	31.1	0.6	3.5
Approach LOS	E	D		

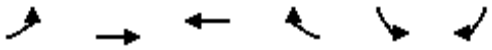
Intersection Summary				
Average Delay	6.4			
Intersection Capacity Utilization	61.2%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	28	376	225	8	7	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	409	245	9	8	12
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		166				
pX, platoon unblocked						
vC, conflicting volume	284				809	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284				809	393
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	98
cM capacity (veh/h)	1244				315	577

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	439	253	20
Volume Left	30	0	8
Volume Right	0	9	12
cSH	1244	1700	436
Volume to Capacity	0.02	0.15	0.04
Queue Length 95th (m)	0.6	0.0	1.1
Control Delay (s)	0.8	0.0	13.6
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	13.6
Approach LOS			B

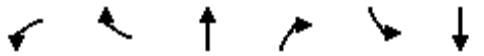
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	15	352	253	7	21	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	383	275	8	23	14
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	332				842	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	332				842	461
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	97
cM capacity (veh/h)	1176				289	510

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	399	283	37
Volume Left	16	0	23
Volume Right	0	8	14
cSH	1176	1700	347
Volume to Capacity	0.01	0.17	0.11
Queue Length 95th (m)	0.3	0.0	2.7
Control Delay (s)	0.5	0.0	16.6
Lane LOS	A		C
Approach Delay (s)	0.5	0.0	16.6
Approach LOS			C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	0	0	0	0	34	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	37	221
Pedestrians	20					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	315	20			20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315	20			20	
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	100			98	
cM capacity (veh/h)	663	1058			1596	

Direction, Lane #	SB 1
Volume Total	258
Volume Left	37
Volume Right	0
cSH	1596
Volume to Capacity	0.02
Queue Length 95th (m)	0.5
Control Delay (s)	1.2
Lane LOS	A
Approach Delay (s)	1.2
Approach LOS	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

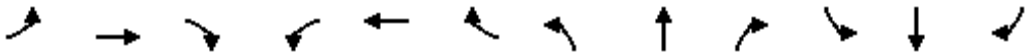
91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	All
Total Delay (hr)	0.2	0.2	0.4	0.8
Delay / Veh (s)	2.3	2.1	24.1	4.2
Stop Delay (hr)	0.1	0.1	0.4	0.6
St Del/Veh (s)	1.4	0.6	22.0	2.9
Total Stops	32	14	67	113
Travel Dist (km)	22.8	25.6	8.8	57.2
Travel Time (hr)	0.9	1.0	0.7	2.5
Avg Speed (kph)	27	27	13	23
Fuel Used (l)	40.0	36.0	13.8	89.9
HC Emissions (g)	4	5	1	10
CO Emissions (g)	1001	1146	229	2376
NOx Emissions (g)	12	15	2	29
Vehicles Entered	298	358	66	722
Vehicles Exited	298	358	66	722
Hourly Exit Rate	298	358	66	722
Input Volume	295	378	69	742
% of Volume	101	95	96	97
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

63: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.3	0.0	0.3	0.1	0.7
Delay / Veh (s)	2.8	0.5	5.2	8.9	3.2
Stop Delay (hr)	0.2	0.0	0.2	0.1	0.5
St Del/Veh (s)	2.2	0.1	4.0	8.1	2.4
Total Stops	22	2	77	17	118
Travel Dist (km)	48.5	14.4	15.7	2.2	80.8
Travel Time (hr)	1.6	0.4	0.8	0.2	2.8
Avg Speed (kph)	32	40	21	14	29
Fuel Used (l)	71.5	17.0	25.6	3.6	117.7
HC Emissions (g)	2	1	2	0	5
CO Emissions (g)	952	276	532	29	1789
NOx Emissions (g)	8	2	6	0	16
Vehicles Entered	391	146	174	32	743
Vehicles Exited	392	146	174	32	744
Hourly Exit Rate	392	146	174	32	744
Input Volume	405	150	181	32	768
% of Volume	97	97	96	100	97
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

Scenario D 2020 PM with background traffic growth and development



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.92		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	0.97	1.00			0.97		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.96		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1493	1546			1432		1594	1606		1420	1415	
Flt Permitted	0.39	1.00			0.89		0.14	1.00		0.28	1.00	
Satd. Flow (perm)	605	1546			1280		240	1606		426	1415	
Volume (vph)	496	316	36	17	121	76	58	349	34	85	185	454
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	528	363	49	39	136	85	74	426	49	99	206	575
RTOR Reduction (vph)	0	7	0	0	24	0	0	6	0	0	139	0
Lane Group Flow (vph)	528	406	0	0	236	0	74	470	0	99	642	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	34.0	34.0			16.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)	36.0	36.0			18.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.50	0.50			0.25		0.39	0.39		0.39	0.39	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	475	773			320		93	625		166	550	
v/s Ratio Prot	c0.22	0.26						0.29			c0.45	
v/s Ratio Perm	c0.34				0.18		0.31			0.23		
v/c Ratio	1.11	0.52			0.74		0.80	0.75		0.60	1.17	
Uniform Delay, d1	16.5	12.2			24.8		19.5	19.0		17.5	22.0	
Progression Factor	1.00	1.00			1.19		1.00	1.00		0.85	0.71	
Incremental Delay, d2	75.4	2.5			14.1		49.1	8.1		13.8	92.2	
Delay (s)	91.9	14.7			43.6		68.6	27.1		28.7	107.9	
Level of Service	F	B			D		E	C		C	F	
Approach Delay (s)		58.1			43.6			32.7			99.0	
Approach LOS		E			D			C			F	

Intersection Summary			
HCM Average Control Delay	65.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.95			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1723			3637	1771	1485
Flt Permitted	1.00			0.61	0.95	1.00
Satd. Flow (perm)	1723			2231	1771	1485
Volume (vph)	688	133	81	587	249	388
Peak-hour factor, PHF	0.87	0.92	0.87	0.87	0.92	0.93
Adj. Flow (vph)	791	145	93	675	271	417
RTOR Reduction (vph)	8	0	0	0	0	100
Lane Group Flow (vph)	928	0	0	768	271	317
Confl. Peds. (#/hr)		75	75		9	3
Confl. Bikes (#/hr)		14				9
Heavy Vehicles (%)	1%	2%	0%	2%	1%	3%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	46.0			46.0	20.0	20.0
Effective Green, g (s)	49.0			49.0	23.0	23.0
Actuated g/C Ratio	0.61			0.61	0.29	0.29
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1055			1366	509	427
v/s Ratio Prot	c0.54				0.15	
v/s Ratio Perm				0.34		c0.21
v/c Ratio	0.88			0.56	0.53	0.74
Uniform Delay, d1	13.0			9.2	24.0	25.8
Progression Factor	0.94			1.00	1.28	1.41
Incremental Delay, d2	9.9			1.7	3.4	9.5
Delay (s)	22.2			10.8	34.0	45.8
Level of Service	C			B	C	D
Approach Delay (s)	22.2			10.8	41.2	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

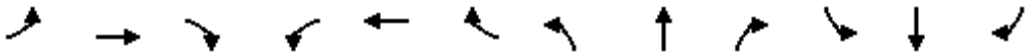
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Volume (veh/h)	516	65	92	598	0	0
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	586	89	156	695	0	0
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.88		0.93	0.88
vC, conflicting volume			710		1328	669
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			672		1105	625
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			81		100	100
cM capacity (veh/h)			807		153	376

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	675	388	464
Volume Left	0	156	0
Volume Right	89	0	0
cSH	1700	807	1700
Volume to Capacity	0.40	0.19	0.27
Queue Length 95th (m)	0.0	5.4	0.0
Control Delay (s)	0.0	5.6	0.0
Lane LOS		A	
Approach Delay (s)	0.0	2.6	
Approach LOS			

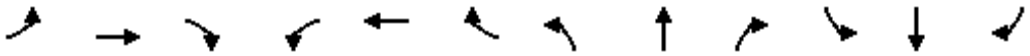
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	176	209	58	45	332	186	84	243	48	43	143	98
Peak Hour Factor	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Hourly flow rate (vph)	217	275	73	69	346	224	120	286	53	64	170	115

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	566	415	224	459	350
Volume Left (vph)	217	69	0	120	64
Volume Right (vph)	73	0	224	53	115
Hadj (s)	0.03	0.12	-0.67	0.02	-0.13
Departure Headway (s)	9.4	9.6	8.8	9.3	9.4
Degree Utilization, x	1.48	1.11	0.55	1.19	0.91
Capacity (veh/h)	391	385	397	390	375
Control Delay (s)	256.1	108.8	20.9	137.7	58.1
Approach Delay (s)	256.1	78.0		137.7	58.1
Approach LOS	F	F		F	F

Intersection Summary				
Delay	138.2			
HCM Level of Service	F			
Intersection Capacity Utilization	87.4%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1732	1498		1855	1355	1668	1799	
Flt Permitted		0.98			0.69	1.00		0.95	1.00	0.12	1.00	
Satd. Flow (perm)		1920			1216	1498		1770	1355	218	1799	
Volume (vph)	12	193	56	96	217	417	53	613	173	275	273	16
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	208	60	97	219	421	55	639	180	281	279	16
RTOR Reduction (vph)	0	12	0	0	0	229	0	0	99	0	3	0
Lane Group Flow (vph)	0	269	0	0	316	192	0	694	81	281	292	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.0			20.0	20.0		33.0	33.0	46.0	46.0	
Effective Green, g (s)		23.0			23.0	23.0		36.0	36.0	49.0	49.0	
Actuated g/C Ratio		0.29			0.29	0.29		0.45	0.45	0.61	0.61	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		552			350	431		797	610	297	1102	
v/s Ratio Prot										c0.11	0.16	
v/s Ratio Perm		0.14			c0.26	0.13		0.39	0.06	c0.47		
v/c Ratio		0.49			0.90	0.44		0.87	0.13	0.95	0.27	
Uniform Delay, d1		23.6			27.4	23.3		19.9	12.9	19.1	7.2	
Progression Factor		1.00			0.90	0.79		0.80	1.15	1.00	1.00	
Incremental Delay, d2		3.1			25.9	2.9		7.8	0.3	40.1	0.6	
Delay (s)		26.7			50.5	21.2		23.6	15.1	59.2	7.8	
Level of Service		C			D	C		C	B	E	A	
Approach Delay (s)		26.7			33.8			21.9			32.8	
Approach LOS		C			C			C			C	

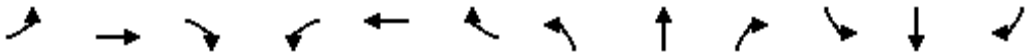
Intersection Summary			
HCM Average Control Delay	28.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.92			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1705	1710		1680	1892	1316		3050			3424	1386
Flt Permitted	0.31	1.00		0.30	1.00	1.00		0.77			0.60	1.00
Satd. Flow (perm)	558	1710		538	1892	1316		2382			2071	1386
Volume (vph)	86	257	97	87	439	75	124	478	167	64	235	51
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	112	317	143	102	453	95	170	525	226	107	264	60
RTOR Reduction (vph)	0	20	0	0	0	45	0	40	0	0	0	30
Lane Group Flow (vph)	112	440	0	102	453	50	0	882	0	0	371	30
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	223	684		215	757	526		1191			1036	693
v/s Ratio Prot		c0.26			0.24							
v/s Ratio Perm	0.20			0.19		0.04		c0.37			0.18	0.02
v/c Ratio	0.50	0.64		0.47	0.60	0.10		0.74			0.36	0.04
Uniform Delay, d1	18.0	19.4		17.8	18.9	15.0		15.9			12.2	10.2
Progression Factor	1.00	1.01		1.00	1.00	1.00		0.88			0.91	0.86
Incremental Delay, d2	7.8	4.6		7.3	3.5	0.4		3.7			0.9	0.1
Delay (s)	25.9	24.1		25.1	22.4	15.3		17.6			12.0	8.9
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		24.4			21.8			17.6			11.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

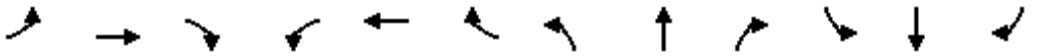
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			4%			0%	
Volume (veh/h)	0	27	0	13	162	0	43	0	36	38	38	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	29	0	14	176	0	47	0	39	41	41	68
Pedestrians		45			51			36			74	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked												
vC, conflicting volume	478	387	157	373	401	145	155			90		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	478	387	157	373	401	145	155			90		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	94	100	97	62	100	97			97		
cM capacity (veh/h)	285	472	828	462	463	809	1371			1439		

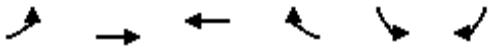
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	190	86	151
Volume Left	0	14	47	41
Volume Right	0	0	39	68
cSH	472	463	1371	1439
Volume to Capacity	0.06	0.41	0.03	0.03
Queue Length 95th (m)	1.5	15.0	0.8	0.7
Control Delay (s)	13.1	18.1	4.3	2.2
Lane LOS	B	C	A	A
Approach Delay (s)	13.1	18.1	4.3	2.2
Approach LOS	B	C		

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.87		1.00	1.00	0.56
Flpb, ped/bikes	0.83	1.00	1.00		0.96	1.00	0.79	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1344	1448	354		1532	684	1370	1546		1723	1739	855
Flt Permitted	0.36	1.00	1.00		0.93	1.00	0.51	1.00		0.19	1.00	1.00
Satd. Flow (perm)	514	1448	354		1439	684	734	1546		353	1739	855
Volume (vph)	78	244	61	31	230	127	121	612	107	78	306	70
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	84	274	73	40	307	149	146	644	134	100	340	84
RTOR Reduction (vph)	0	0	49	0	0	21	0	4	0	0	0	0
Lane Group Flow (vph)	84	274	24	0	347	128	146	774	0	100	340	84
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	23.0	23.0	23.0		23.0	23.0	43.0	43.0		43.0	43.0	43.0
Effective Green, g (s)	26.0	26.0	26.0		26.0	26.0	46.0	46.0		46.0	46.0	46.0
Actuated g/C Ratio	0.32	0.32	0.32		0.32	0.32	0.57	0.57		0.57	0.57	0.57
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	167	471	115		468	222	422	889		203	1000	492
v/s Ratio Prot		0.19						c0.50			0.20	
v/s Ratio Perm	0.16		0.07		c0.24	0.19	0.20			0.28		0.10
v/c Ratio	0.50	0.58	0.21		0.74	0.58	0.35	0.87		0.49	0.34	0.17
Uniform Delay, d1	21.8	22.5	19.5		24.0	22.4	9.0	14.5		10.1	9.0	8.0
Progression Factor	0.98	0.94	1.24		0.69	0.60	1.14	1.22		0.78	0.75	0.73
Incremental Delay, d2	9.5	4.7	3.7		9.6	9.9	2.1	10.9		7.9	0.9	0.7
Delay (s)	30.8	25.7	28.0		26.1	23.3	12.4	28.5		15.8	7.6	6.6
Level of Service	C	C	C		C	C	B	C		B	A	A
Approach Delay (s)		27.1			25.2			26.0			9.0	
Approach LOS		C			C			C			A	

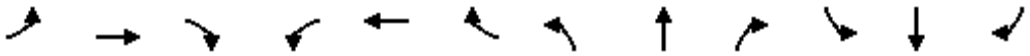
Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	18	358	502	8	26	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	389	546	9	28	71
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		87				
pX, platoon unblocked						
vC, conflicting volume	638				1065	634
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	638				1065	634
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				87	84
cM capacity (veh/h)	877				223	445

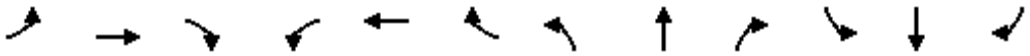
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	554	99
Volume Left	20	0	28
Volume Right	0	9	71
cSH	877	1700	346
Volume to Capacity	0.02	0.33	0.29
Queue Length 95th (m)	0.5	0.0	8.8
Control Delay (s)	0.7	0.0	19.5
Lane LOS	A		C
Approach Delay (s)	0.7	0.0	19.5
Approach LOS			C

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		0.84			1.00						0.75	
Flpb, ped/bikes		1.00			1.00						0.91	
Frt		0.98			1.00						0.95	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1247			1598						1374	
Flt Permitted		1.00			1.00						0.99	
Satd. Flow (perm)		1247			1598						1374	
Volume (vph)	0	302	44	0	377	0	0	0	0	12	76	74
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	0	336	71	0	428	0	0	0	0	31	112	92
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	398	0	0	428	0	0	0	0	0	226	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type										Perm		
Protected Phases		4			8						6	
Permitted Phases										6		
Actuated Green, G (s)		44.0			44.0						24.0	
Effective Green, g (s)		46.0			46.0						26.0	
Actuated g/C Ratio		0.57			0.57						0.32	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		717			919						447	
v/s Ratio Prot		c0.32			0.27							
v/s Ratio Perm											0.16	
v/c Ratio		0.55			0.47						0.51	
Uniform Delay, d1		10.6			9.9						21.8	
Progression Factor		1.07			0.82						1.00	
Incremental Delay, d2		2.4			0.9						4.0	
Delay (s)		13.7			9.0						25.8	
Level of Service		B			A						C	
Approach Delay (s)		13.7			9.0			0.0			25.8	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



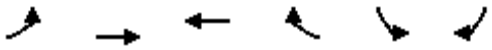
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			2%			0%	
Volume (veh/h)	51	54	7	12	163	79	17	37	20	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	59	8	13	177	86	18	40	22	0	0	0
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	406	233	123	232	222	178	75			121		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	406	233	123	232	222	178	75			121		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	90	99	98	70	90	99			100		
cM capacity (veh/h)	326	585	833	546	593	821	1426			1392		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	122	276	80
Volume Left	55	13	18
Volume Right	8	86	22
cSH	436	647	1426
Volume to Capacity	0.28	0.43	0.01
Queue Length 95th (m)	8.6	16.2	0.3
Control Delay (s)	16.4	14.7	1.8
Lane LOS	C	B	A
Approach Delay (s)	16.4	14.7	1.8
Approach LOS	C	B	

Intersection Summary				
Average Delay	12.9			
Intersection Capacity Utilization	46.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.83		1.00	0.93		1.00	0.78			0.83	
Flpb, ped/bikes	0.64	1.00		0.71	1.00		1.00	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.92			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1154	1227		1199	1472		1635	1357			1490	
Flt Permitted	0.49	1.00		0.45	1.00		0.40	1.00			0.36	
Satd. Flow (perm)	600	1227		568	1472		696	1357			534	
Volume (vph)	55	286	62	172	267	26	167	298	321	47	226	100
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	60	304	85	246	310	28	232	324	345	51	246	109
RTOR Reduction (vph)	0	12	0	0	4	0	0	33	0	0	16	0
Lane Group Flow (vph)	60	377	0	246	334	0	232	636	0	0	390	0
Confl. Peds. (#/hr)	435		420	420		435	271		340	340		271
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.0	40.0		40.0	40.0		28.0	28.0			28.0	
Effective Green, g (s)	42.0	42.0		42.0	42.0		30.0	30.0			30.0	
Actuated g/C Ratio	0.52	0.52		0.52	0.52		0.38	0.38			0.38	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	315	644		298	773		261	509			200	
v/s Ratio Prot		0.31			0.23			0.47				
v/s Ratio Perm	0.10			c0.43			0.33				c0.73	
v/c Ratio	0.19	0.58		0.83	0.43		0.89	1.25			1.95	
Uniform Delay, d1	10.0	13.0		15.9	11.7		23.4	25.0			25.0	
Progression Factor	0.97	0.87		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.2	3.6		22.3	1.8		33.2	127.7			443.8	
Delay (s)	11.0	14.9		38.2	13.4		56.6	152.7			468.7	
Level of Service	B	B		D	B		E	F			F	
Approach Delay (s)		14.4			23.9			128.0			468.7	
Approach LOS		B			C			F			F	

Intersection Summary			
HCM Average Control Delay	139.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Volume (veh/h)	323	354	361	165	30	129
Peak Hour Factor	0.94	0.91	0.85	0.96	0.92	0.92
Hourly flow rate (vph)	344	389	425	172	33	140
Pedestrians		16	33		435	
Lane Width (m)		3.0	3.0		4.8	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		1	2		48	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	1032				1969	876
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1032				1969	876
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	0				0	21
cM capacity (veh/h)	342				0	177

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	344	389	425	172	173
Volume Left	344	0	0	0	33
Volume Right	0	0	0	172	140
cSH	342	1700	1700	1700	0
Volume to Capacity	1.00	0.23	0.25	0.10	Err
Queue Length 95th (m)	87.0	0.0	0.0	0.0	Err
Control Delay (s)	85.6	0.0	0.0	0.0	Err
Lane LOS	F				F
Approach Delay (s)	40.1		0.0		Err
Approach LOS					F

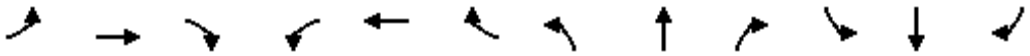
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	398	82	61	365	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	433	89	66	397	0	0
Pedestrians	591			3	630	
Lane Width (m)	3.0			3.0	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	41			0	0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.87		0.93	0.87
vC, conflicting volume			1152		2228	1110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1175		2102	1127
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		100	100
cM capacity (veh/h)			516		27	215

Direction, Lane #	EB 1	WB 1
Volume Total	522	463
Volume Left	0	66
Volume Right	89	0
cSH	1700	516
Volume to Capacity	0.31	0.13
Queue Length 95th (m)	0.0	3.3
Control Delay (s)	0.0	3.7
Lane LOS		A
Approach Delay (s)	0.0	3.7
Approach LOS		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	27	0	16	249	0	52	0	0	0	55	80
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	29	0	17	271	0	57	0	0	0	60	87
Pedestrians		28			32			60			84	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	464	276	191	323	320	116	175			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	464	276	191	323	320	116	175			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	100	97	50	100	96			100		
cM capacity (veh/h)	263	574	787	520	543	845	1368			1537		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	288	57	147
Volume Left	0	17	57	0
Volume Right	0	0	0	87
cSH	574	542	1368	1537
Volume to Capacity	0.05	0.53	0.04	0.00
Queue Length 95th (m)	1.2	23.6	1.0	0.0
Control Delay (s)	11.6	18.9	7.7	0.0
Lane LOS	B	C	A	
Approach Delay (s)	11.6	18.9	7.7	0.0
Approach LOS	B	C		

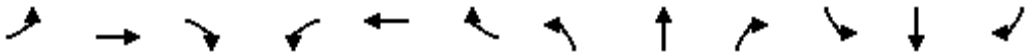
Intersection Summary				
Average Delay	12.0			
Intersection Capacity Utilization	52.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Volume (veh/h)	60	377	536	0	28	284
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	410	583	0	30	309
Pedestrians	52		163			169
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.84	0.83			0.83	
vC, conflicting volume	1167	804			635	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1140	763			558	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	56	0			96	
cM capacity (veh/h)	148	274			801	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	475	583	339
Volume Left	65	0	30
Volume Right	410	0	0
cSH	245	1700	801
Volume to Capacity	1.94	0.34	0.04
Queue Length 95th (m)	258.2	0.0	0.9
Control Delay (s)	470.2	0.0	1.3
Lane LOS	F		A
Approach Delay (s)	470.2	0.0	1.3
Approach LOS	F		

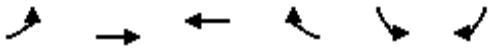
Intersection Summary			
Average Delay	160.2		
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			3%	
Volume (veh/h)	33	47	0	40	74	175	54	484	87	134	196	126
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)	36	51	0	43	80	190	59	526	95	146	213	137
Pedestrians		94			157			19			78	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			13			2			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)											141	
pX, platoon unblocked	0.97	0.97	0.97	0.97	0.97		0.97					
vC, conflicting volume	1666	1562	395	1465	1583	808	444			778		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1685	1578	377	1479	1600	808	428			778		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	20	100	0	0	38	94			80		
cM capacity (veh/h)	0	64	589	21	62	308	1011			726		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	87	314	679	496
Volume Left	36	43	59	146
Volume Right	0	190	95	137
cSH	0	79	1011	726
Volume to Capacity	Err	3.98	0.06	0.20
Queue Length 95th (m)	Err	Err	1.4	5.7
Control Delay (s)	Err	Err	1.5	5.3
Lane LOS	F	F	A	A
Approach Delay (s)	Err	Err	1.5	5.3
Approach LOS	F	F		

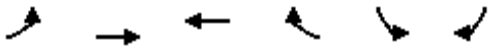
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	51	409	491	8	23	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	445	534	9	25	13
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		168				
pX, platoon unblocked						
vC, conflicting volume	573				1184	682
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	573				1184	682
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				86	97
cM capacity (veh/h)	973				182	395

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	500	542	38
Volume Left	55	0	25
Volume Right	0	9	13
cSH	973	1700	223
Volume to Capacity	0.06	0.32	0.17
Queue Length 95th (m)	1.4	0.0	4.6
Control Delay (s)	1.6	0.0	24.4
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	24.4
Approach LOS			C

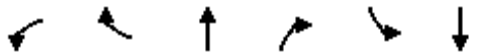
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Volume (veh/h)	55	344	495	16	52	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	374	538	17	57	21
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)		247				
pX, platoon unblocked						
vC, conflicting volume	604				1188	729
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	604				1188	729
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				67	94
cM capacity (veh/h)	933				171	359

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	434	555	77
Volume Left	60	0	57
Volume Right	0	17	21
cSH	933	1700	198
Volume to Capacity	0.06	0.33	0.39
Queue Length 95th (m)	1.6	0.0	13.0
Control Delay (s)	1.9	0.0	34.2
Lane LOS	A		D
Approach Delay (s)	1.9	0.0	34.2
Approach LOS			D

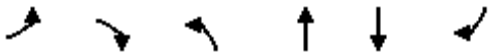
Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Volume (veh/h)	0	0	0	0	141	233
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	153	253
Pedestrians	102					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	662	102			102	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	662	102			102	
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	100			90	
cM capacity (veh/h)	383	953			1490	

Direction, Lane #	SB 1
Volume Total	407
Volume Left	153
Volume Right	0
cSH	1490
Volume to Capacity	0.10
Queue Length 95th (m)	2.6
Control Delay (s)	3.5
Lane LOS	A
Approach Delay (s)	3.5
Approach LOS	

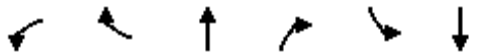
Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Volume (veh/h)	0	0	42	374	140	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	46	407	152	70
Pedestrians	141					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	826	328	363			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826	328	363			
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	100	96			
cM capacity (veh/h)	329	713	1196			

Direction, Lane #	NB 1	SB 1
Volume Total	452	222
Volume Left	46	0
Volume Right	0	70
cSH	1196	1700
Volume to Capacity	0.04	0.13
Queue Length 95th (m)	0.9	0.0
Control Delay (s)	1.2	0.0
Lane LOS	A	
Approach Delay (s)	1.2	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	30	28	362	0	0	342
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	30	393	0	0	372
Pedestrians			75			81
Lane Width (m)			3.7			3.7
Walking Speed (m/s)			1.2			1.2
Percent Blockage			6			7
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)			58			237
pX, platoon unblocked						
vC, conflicting volume	840	474			393	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	840	474			393	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	94			100	
cM capacity (veh/h)	314	549			1165	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	63	393	372
Volume Left	33	0	0
Volume Right	30	0	0
cSH	396	1700	1700
Volume to Capacity	0.16	0.23	0.22
Queue Length 95th (m)	4.3	0.0	0.0
Control Delay (s)	15.8	0.0	0.0
Lane LOS	C		
Approach Delay (s)	15.8	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

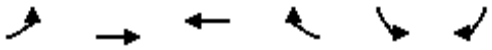
174: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.7	0.1	6.1	1.3	8.2
Delay / Veh (s)	8.2	1.1	102.9	36.3	30.5
Stop Delay (hr)	0.6	0.0	6.0	1.3	7.9
St Del/Veh (s)	6.3	0.1	102.2	35.7	29.3
Total Stops	94	5	215	118	432
Travel Dist (km)	39.3	31.1	24.4	8.8	103.7
Travel Time (hr)	1.7	0.8	6.8	1.7	11.0
Avg Speed (kph)	23	39	4	5	10
Fuel Used (l)	58.9	27.1	76.6	22.4	185.0
HC Emissions (g)	2	1	1	0	4
CO Emissions (g)	752	217	364	124	1457
NOx Emissions (g)	7	2	3	1	14
Vehicles Entered	319	309	219	134	981
Vehicles Exited	318	309	207	133	967
Hourly Exit Rate	318	309	207	133	967
Input Volume	340	397	231	138	1106
% of Volume	94	78	90	96	87
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	All
Total Delay (hr)	1.0	0.5	2.6	4.0
Delay / Veh (s)	10.3	3.8	55.5	15.0
Stop Delay (hr)	0.8	0.2	2.5	3.5
St Del/Veh (s)	8.5	1.9	53.5	13.2
Total Stops	108	53	179	340
Travel Dist (km)	25.7	34.0	22.1	81.9
Travel Time (hr)	1.8	1.4	3.2	6.4
Avg Speed (kph)	15	24	7	13
Fuel Used (l)	48.5	52.6	46.5	147.6
HC Emissions (g)	9	3	0	13
CO Emissions (g)	1773	891	317	2981
NOx Emissions (g)	25	10	2	37
Vehicles Entered	340	456	167	963
Vehicles Exited	341	456	167	964
Hourly Exit Rate	341	456	167	964
Input Volume	351	534	172	1057
% of Volume	97	85	97	91
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Scenario C 2020 AM with modifications



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	113	212	209	31	61	150
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Peak Hour Factor	0.85	0.78	0.90	0.88	1.00	0.93
Hourly flow rate (vph)	133	272	232	35	61	161
Pedestrians		37	65		330	
Lane Width (m)		3.0	3.0		4.2	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		3	5		32	
Right turn flare (veh)						3
Median type		None	None			
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	597				1165	599
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	597				1165	599
tC, single (s)	4.1				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				49	51
cM capacity (veh/h)	655				118	330

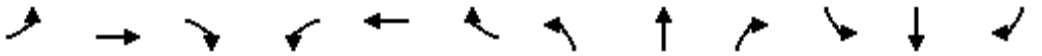
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	133	272	232	35	222
Volume Left	133	0	0	0	61
Volume Right	0	0	0	35	161
cSH	655	1700	1700	1700	432
Volume to Capacity	0.20	0.16	0.14	0.02	0.51
Queue Length 95th (m)	5.7	0.0	0.0	0.0	21.8
Control Delay (s)	11.9	0.0	0.0	0.0	36.3
Lane LOS	B				E
Approach Delay (s)	3.9		0.0		36.3
Approach LOS					E

Intersection Summary			
Average Delay	10.8		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

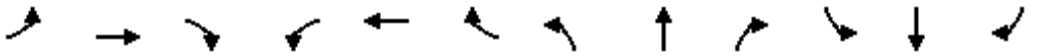
HCM Signalized Intersection Capacity Analysis
73: Spring Garden Road & South Park Street

3/29/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	206	97	35	175	75	53	408	72	81	396	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.89		1.00	1.00	0.68
Flpb, ped/bikes	0.76	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1209	1564	545		1316	802	1658	1571		1790	1773	1021
Flt Permitted	0.54	1.00	1.00		0.91	1.00	0.38	1.00		0.30	1.00	1.00
Satd. Flow (perm)	688	1564	545		1211	802	667	1571		569	1773	1021
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	130	245	117	41	194	90	73	469	104	121	471	53
RTOR Reduction (vph)	0	0	73	0	0	56	0	10	0	0	0	17
Lane Group Flow (vph)	130	245	44	0	235	34	73	563	0	121	471	36
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	27.0	27.0	27.0		27.0	27.0	39.0	39.0		39.0	39.0	39.0
Effective Green, g (s)	30.0	30.0	30.0		30.0	30.0	42.0	42.0		42.0	42.0	42.0
Actuated g/C Ratio	0.38	0.38	0.38		0.38	0.38	0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	258	587	204		454	301	350	825		299	931	536
v/s Ratio Prot		0.16						c0.36			0.27	
v/s Ratio Perm	0.19		0.08		c0.19	0.04	0.11			0.21		0.04
v/c Ratio	0.50	0.42	0.22		0.52	0.11	0.21	0.68		0.40	0.51	0.07
Uniform Delay, d1	19.3	18.5	17.0		19.4	16.3	10.1	14.1		11.5	12.3	9.4
Progression Factor	1.00	1.00	1.00		0.71	0.31	1.12	1.27		0.76	0.77	0.61
Incremental Delay, d2	6.9	2.2	2.4		4.1	0.7	1.3	4.3		3.8	1.8	0.2
Delay (s)	26.1	20.7	19.4		17.8	5.9	12.6	22.2		12.5	11.3	5.9
Level of Service	C	C	B		B	A	B	C		B	B	A
Approach Delay (s)		21.8			14.5			21.1			11.1	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

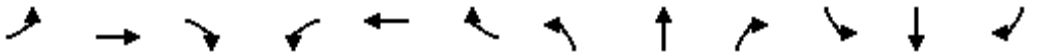


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	275	61	25	207	0	0	0	0	25	84	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						1.00	
Frpb, ped/bikes		0.87		1.00	1.00						0.81	
Flpb, ped/bikes		1.00		0.78	1.00						0.92	
Frt		0.97		1.00	1.00						0.95	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1369		1312	1364						1518	
Flt Permitted		1.00		0.44	1.00						0.99	
Satd. Flow (perm)		1369		613	1364						1518	
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	0	327	82	42	241	0	0	0	0	33	109	79
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	398	0	42	241	0	0	0	0	0	196	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		42.0		42.0	42.0						26.0	
Effective Green, g (s)		44.0		44.0	44.0						28.0	
Actuated g/C Ratio		0.55		0.55	0.55						0.35	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Lane Grp Cap (vph)		753		337	750						531	
v/s Ratio Prot		c0.29			0.18							
v/s Ratio Perm				0.07							0.13	
v/c Ratio		0.53		0.12	0.32						0.37	
Uniform Delay, d1		11.4		8.7	9.8						19.4	
Progression Factor		0.75		0.77	0.80						0.94	
Incremental Delay, d2		2.4		0.7	1.0						1.8	
Delay (s)		10.9		7.4	8.9						20.0	
Level of Service		B		A	A						C	
Approach Delay (s)		10.9			8.7			0.0			20.0	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	219	64	141	227	7	46	128	125	19	279	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.88		1.00	0.98		1.00	0.83			0.89	
Flpb, ped/bikes		0.95		0.70	1.00		1.00	1.00			0.99	
Frt		0.97		1.00	0.99		1.00	0.92			0.96	
Flt Protected		0.99		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		2482		1156	1400		1503	1434			1784	
Flt Permitted		0.88		0.49	1.00		0.35	1.00			0.96	
Satd. Flow (perm)		2205		600	1400		558	1434			1717	
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	53	274	83	178	252	9	55	144	164	35	317	139
RTOR Reduction (vph)	0	28	0	0	2	0	0	51	0	0	18	0
Lane Group Flow (vph)	0	382	0	178	260	0	55	257	0	0	473	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		38.0		38.0	38.0		30.0	30.0			30.0	
Effective Green, g (s)		40.0		40.0	40.0		32.0	32.0			32.0	
Actuated g/C Ratio		0.50		0.50	0.50		0.40	0.40			0.40	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		1103		300	700		223	574			687	
v/s Ratio Prot					0.19			0.18				
v/s Ratio Perm		0.17		c0.30			0.10				c0.28	
v/c Ratio		0.35		0.59	0.37		0.25	0.45			0.69	
Uniform Delay, d1		12.1		14.2	12.3		16.0	17.5			19.9	
Progression Factor		0.79		1.00	1.00		0.70	0.54			1.19	
Incremental Delay, d2		0.8		8.4	1.5		2.6	2.5			4.9	
Delay (s)		10.4		22.6	13.8		13.8	12.0			28.5	
Level of Service		B		C	B		B	B			C	
Approach Delay (s)		10.4			17.4			12.3			28.5	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	262	347	37	7	36	34	9	165	25	224	281	508
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.90	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1625	1786			1685		1807	1806		1635	1664	
Flt Permitted	0.60	1.00			0.89		0.11	1.00		0.58	1.00	
Satd. Flow (perm)	1023	1786			1513		211	1806		1001	1664	
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	288	369	53	18	42	41	18	206	36	238	339	591
RTOR Reduction (vph)	0	7	0	0	31	0	0	9	0	0	87	0
Lane Group Flow (vph)	288	415	0	0	70	0	18	234	0	238	843	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.0	26.0			16.0		34.0	34.0		34.0	34.0	
Effective Green, g (s)	26.0	28.0			18.0		36.0	36.0		36.0	36.0	
Actuated g/C Ratio	0.36	0.39			0.25		0.50	0.50		0.50	0.50	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	420	695			378		106	903		501	832	
v/s Ratio Prot	c0.06	0.23						0.13			c0.51	
v/s Ratio Perm	c0.19				0.05		0.09			0.24		
v/c Ratio	0.69	0.60			0.19		0.17	0.26		0.48	1.01	
Uniform Delay, d1	20.2	17.5			21.2		9.8	10.3		11.8	18.0	
Progression Factor	1.00	1.00			1.43		1.04	1.06		0.92	0.75	
Incremental Delay, d2	8.8	3.8			1.1		3.4	0.7		2.5	30.8	
Delay (s)	29.0	21.3			31.5		13.7	11.6		13.4	44.2	
Level of Service	C	C			C		B	B		B	D	
Approach Delay (s)		24.4			31.5			11.8			37.9	
Approach LOS		C			C			B			D	

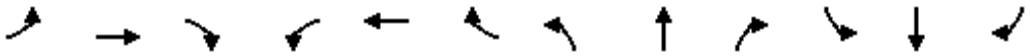
Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	561	199	152	424	97	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.94			1.00	1.00	0.95
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1667			3605	1789	1528
Flt Permitted	1.00			0.56	0.95	1.00
Satd. Flow (perm)	1667			2057	1789	1528
Peak-hour factor, PHF	0.91	0.82	0.87	0.82	0.85	0.88
Adj. Flow (vph)	616	243	175	517	114	173
RTOR Reduction (vph)	18	0	0	0	0	138
Lane Group Flow (vph)	841	0	0	692	114	35
Confl. Peds. (#/hr)		44	44		4	5
Confl. Bikes (#/hr)		31				2
Heavy Vehicles (%)	2%	1%	2%	2%	0%	0%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	53.0			53.0	13.0	13.0
Effective Green, g (s)	56.0			56.0	16.0	16.0
Actuated g/C Ratio	0.70			0.70	0.20	0.20
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1167			1440	358	306
v/s Ratio Prot	c0.50				c0.06	
v/s Ratio Perm				0.34		0.02
v/c Ratio	0.72			0.48	0.32	0.11
Uniform Delay, d1	7.3			5.4	27.3	26.2
Progression Factor	1.30			1.00	1.06	1.39
Incremental Delay, d2	3.1			1.2	2.3	0.7
Delay (s)	12.6			6.6	31.4	37.1
Level of Service	B			A	C	D
Approach Delay (s)	12.6			6.6	34.8	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

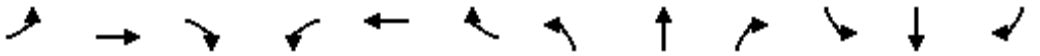
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	101	225	50	44	141	47	36	141	54	148	180	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.6	3.7	3.7	3.7	3.7	3.7	4.6	3.7	3.0	4.8	3.7
Grade (%)		3%			7%			-3%			3%	
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	
Frpb, ped/bikes		0.94			1.00	0.63		0.88			0.95	
Flpb, ped/bikes		0.93			1.00	1.00		1.00			0.90	
Frt		0.98			1.00	0.85		0.97			0.99	
Flt Protected		0.99			0.99	1.00		0.99			0.98	
Satd. Flow (prot)		1734			1796	974		1766			1714	
Flt Permitted		0.86			0.86	1.00		0.91			0.76	
Satd. Flow (perm)		1511			1558	974		1611			1323	
Peak-hour factor, PHF	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	104	232	52	47	150	50	40	158	61	156	189	36
RTOR Reduction (vph)	0	7	0	0	0	28	0	14	0	0	5	0
Lane Group Flow (vph)	0	381	0	0	197	22	0	245	0	0	376	0
Confl. Peds. (#/hr)	80		97	97		80	154		135	135		154
Confl. Bikes (#/hr)			6			2			2			1
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		33.0			33.0	33.0		35.0			35.0	
Effective Green, g (s)		35.0			35.0	35.0		37.0			37.0	
Actuated g/C Ratio		0.44			0.44	0.44		0.46			0.46	
Clearance Time (s)		6.0			6.0	6.0		6.0			6.0	
Lane Grp Cap (vph)		661			682	426		745			612	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.13	0.02		0.15			c0.28	
v/c Ratio		0.58			0.29	0.05		0.33			0.61	
Uniform Delay, d1		16.9			14.5	12.9		13.6			16.1	
Progression Factor		0.84			1.00	1.00		1.28			0.62	
Incremental Delay, d2		3.2			1.1	0.2		1.1			3.9	
Delay (s)		17.4			15.6	13.2		18.5			13.8	
Level of Service		B			B	B		B			B	
Approach Delay (s)		17.4			15.1			18.5			13.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

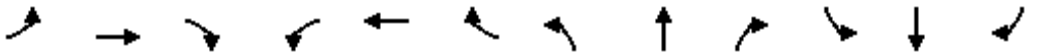
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	218	39	109	166	140	17	257	115	488	351	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2001			1715	1502		1857	1350	1642	1812	
Flt Permitted		0.98			0.64	1.00		0.96	1.00	0.31	1.00	
Satd. Flow (perm)		1967			1119	1502		1790	1350	539	1812	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	237	42	115	175	147	19	286	128	530	382	7
RTOR Reduction (vph)	0	8	0	0	0	101	0	0	90	0	1	0
Lane Group Flow (vph)	0	283	0	0	290	46	0	305	38	530	388	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		21.0	21.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		24.0	24.0	44.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.30	0.30	0.55	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		615			350	469		537	405	558	1065	
v/s Ratio Prot										c0.23	0.21	
v/s Ratio Perm		0.14			c0.26	0.03		0.17	0.03	c0.30		
v/c Ratio		0.46			0.83	0.10		0.57	0.09	0.95	0.36	
Uniform Delay, d1		22.1			25.5	19.5		23.6	20.2	13.7	8.7	
Progression Factor		1.00			0.87	0.54		0.93	1.37	1.00	1.00	
Incremental Delay, d2		2.5			18.3	0.4		3.5	0.4	27.5	1.0	
Delay (s)		24.6			40.4	10.9		25.4	28.0	41.2	9.6	
Level of Service		C			D	B		C	C	D	A	
Approach Delay (s)		24.6			30.5			26.2			27.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

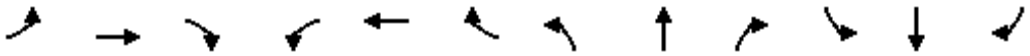
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	212	188	58	186	35	97	316	105	106	373	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1592	1659		1681	1874	1369		3215			3486	1527
Flt Permitted	0.57	1.00		0.30	1.00	1.00		0.66			0.66	1.00
Satd. Flow (perm)	958	1659		538	1874	1369		2156			2338	1527
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	252	219	66	221	49	156	395	114	129	455	81
RTOR Reduction (vph)	0	39	0	0	0	29	0	22	0	0	0	42
Lane Group Flow (vph)	49	432	0	66	221	20	0	643	0	0	584	39
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	395	684		222	773	565		1051			1140	744
v/s Ratio Prot		c0.26			0.12							
v/s Ratio Perm	0.05			0.12		0.01		c0.30			0.25	0.03
v/c Ratio	0.12	0.63		0.30	0.29	0.04		0.61			0.51	0.05
Uniform Delay, d1	14.6	18.7		15.7	15.7	14.0		15.0			14.0	10.8
Progression Factor	0.98	0.92		0.95	0.93	0.92		0.65			0.86	0.62
Incremental Delay, d2	0.6	4.2		3.4	0.9	0.1		2.4			1.5	0.1
Delay (s)	14.9	21.4		18.3	15.4	13.0		12.2			13.5	6.8
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		20.8			15.6			12.2			12.7	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	9	6	19	13	29	15	236	30	107	312	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			3%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			0.82			0.94			0.95	
Flpb, ped/bikes		0.81			0.98			0.99			0.94	
Frt		0.98			0.94			0.99			0.98	
Flt Protected		0.97			0.98			1.00			0.99	
Satd. Flow (prot)		1421			1387			1731			1613	
Flt Permitted		0.85			0.92			0.97			0.85	
Satd. Flow (perm)		1246			1300			1682			1391	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	10	7	21	14	32	16	257	33	116	339	61
RTOR Reduction (vph)	0	5	0	0	23	0	0	5	0	0	6	0
Lane Group Flow (vph)	0	37	0	0	44	0	0	301	0	0	510	0
Confl. Peds. (#/hr)	83		17	17		83	85		165	165		85
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.0			21.0			47.0			47.0	
Effective Green, g (s)		23.0			23.0			49.0			49.0	
Actuated g/C Ratio		0.29			0.29			0.61			0.61	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		358			374			1030			852	
v/s Ratio Prot												
v/s Ratio Perm		0.03			c0.03			0.18			c0.37	
v/c Ratio		0.10			0.12			0.29			0.60	
Uniform Delay, d1		20.9			21.0			7.3			9.5	
Progression Factor		1.00			1.00			1.07			0.92	
Incremental Delay, d2		0.6			0.6			0.7			2.4	
Delay (s)		21.5			21.7			8.5			11.1	
Level of Service		C			C			A			B	
Approach Delay (s)		21.5			21.7			8.5			11.1	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	848	170	131	425	0	0
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	874	175	149	483	0	0
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.70		0.73	0.70
vC, conflicting volume			1084		1538	1005
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			910		1270	797
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			72		100	100
cM capacity (veh/h)			524		83	230

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	1049	310	322
Volume Left	0	149	0
Volume Right	175	0	0
cSH	1700	524	1700
Volume to Capacity	0.62	0.28	0.19
Queue Length 95th (m)	0.0	8.8	0.0
Control Delay (s)	0.0	9.4	0.0
Lane LOS		A	
Approach Delay (s)	0.0	4.6	
Approach LOS			

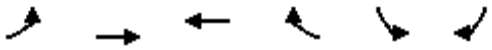
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	34	99	425	0	0	488
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	108	462	0	0	530
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.92	0.87			0.87	
vC, conflicting volume	1198	619			534	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	862	490			393	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	75			100	
cM capacity (veh/h)	249	439			954	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	37	108	462	530
Volume Left	37	0	0	0
Volume Right	0	108	0	0
cSH	249	439	1700	954
Volume to Capacity	0.15	0.25	0.27	0.00
Queue Length 95th (m)	3.9	7.2	0.0	0.0
Control Delay (s)	21.9	15.8	0.0	0.0
Lane LOS	C	C		
Approach Delay (s)	17.4		0.0	0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	363	247	5	20	12
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	395	268	5	22	13
Pedestrians		1	3		80	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		7	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		87	239			
pX, platoon unblocked						
vC, conflicting volume	354				768	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354				768	352
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	98
cM capacity (veh/h)	1122				340	643

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	404	274	35
Volume Left	10	0	22
Volume Right	0	5	13
cSH	1122	1700	413
Volume to Capacity	0.01	0.16	0.08
Queue Length 95th (m)	0.2	0.0	2.1
Control Delay (s)	0.3	0.0	14.5
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	14.5
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	46	17	129	16	17	408
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)	50	18	140	17	18	443
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			61			237
pX, platoon unblocked						
vC, conflicting volume	674	195			179	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	674	195			179	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	98			99	
cM capacity (veh/h)	398	813			1372	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	158	462
Volume Left	50	0	18
Volume Right	18	17	0
cSH	462	1700	1372
Volume to Capacity	0.15	0.09	0.01
Queue Length 95th (m)	3.9	0.0	0.3
Control Delay (s)	14.1	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	14.1	0.0	0.4
Approach LOS	B		

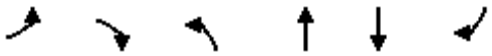
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	349	50	22	231	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	379	54	24	251	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.91		0.93	0.91
vC, conflicting volume			434		1005	407
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			326		870	296
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1120		232	675

Direction, Lane #	EB 1	WB 1
Volume Total	434	275
Volume Left	0	24
Volume Right	54	0
cSH	1700	1120
Volume to Capacity	0.26	0.02
Queue Length 95th (m)	0.0	0.5
Control Delay (s)	0.0	0.9
Lane LOS		A
Approach Delay (s)	0.0	0.9
Approach LOS		

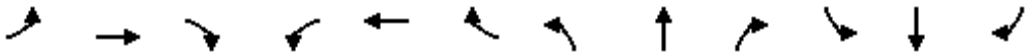
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	8	0	78	142	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	9	0	85	154	23
Pedestrians	24					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	275	190	201			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	275	190	201			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	700	835	1343			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	85	177
Volume Left	10	0	0
Volume Right	9	0	23
cSH	758	1343	1700
Volume to Capacity	0.02	0.00	0.10
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	9.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.9	0.0	0.0
Approach LOS	A		

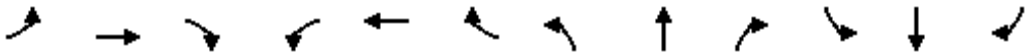
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	8	59	0	16	0	18	35	54	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			4%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	9	64	0	17	0	20	38	59	30
Pedestrians		75			31			31			28	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					162							
pX, platoon unblocked												
vC, conflicting volume	92			31			247	141	62	160	141	167
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	92			31			247	141	62	160	141	167
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	98	95	92	96
cM capacity (veh/h)	1466			1540			555	709	950	718	709	801

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	73	37	127
Volume Left	0	9	17	38
Volume Right	0	0	20	30
cSH	1700	1540	712	732
Volume to Capacity	0.00	0.01	0.05	0.17
Queue Length 95th (m)	0.0	0.1	1.2	4.8
Control Delay (s)	0.0	0.9	10.3	11.0
Lane LOS		A	B	B
Approach Delay (s)	0.0	0.9	10.3	11.0
Approach LOS			B	B

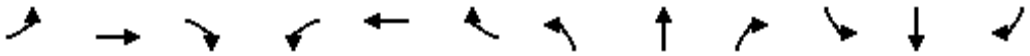
Intersection Summary				
Average Delay	7.8			
Intersection Capacity Utilization	29.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	42	10	5	55	45	7	22	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			2%			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)	16	46	11	5	60	49	8	24	3	0	0	0
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					81							
pX, platoon unblocked												
vC, conflicting volume	118			98			269	253	127	238	234	142
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	118			98			269	253	127	238	234	142
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	96	100	100	100	100
cM capacity (veh/h)	1471			1443			608	618	864	647	633	867

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	73	114	35
Volume Left	16	5	8
Volume Right	11	49	3
cSH	1471	1443	633
Volume to Capacity	0.01	0.00	0.05
Queue Length 95th (m)	0.3	0.1	1.3
Control Delay (s)	1.7	0.4	11.0
Lane LOS	A	A	B
Approach Delay (s)	1.7	0.4	11.0
Approach LOS			B

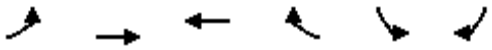
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	4	89	0	6	0	0	0	41	31
Sign Control		Free			Free			Stop			Stop	
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)	0	0	0	4	97	0	7	0	0	0	45	34
Pedestrians		90			18			48			50	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					237							
pX, platoon unblocked												
vC, conflicting volume	147			48			299	203	66	173	203	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	147			48			299	203	66	173	203	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	93	95
cM capacity (veh/h)	1374			1495			487	634	942	696	634	709

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	101	7	78
Volume Left	0	4	7	0
Volume Right	0	0	0	34
cSH	1700	1495	487	664
Volume to Capacity	0.00	0.00	0.01	0.12
Queue Length 95th (m)	0.0	0.1	0.3	3.0
Control Delay (s)	0.0	0.3	12.5	11.1
Lane LOS		A	B	B
Approach Delay (s)	0.0	0.3	12.5	11.1
Approach LOS			B	B

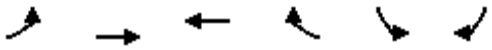
Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	28	376	213	8	11	31
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	409	232	9	12	34
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		166	161			
pX, platoon unblocked						
vC, conflicting volume	271				796	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	271				796	380
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	94
cM capacity (veh/h)	1258				321	587

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	439	240	46
Volume Left	30	0	12
Volume Right	0	9	34
cSH	1258	1700	482
Volume to Capacity	0.02	0.14	0.09
Queue Length 95th (m)	0.6	0.0	2.4
Control Delay (s)	0.8	0.0	13.3
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	13.3
Approach LOS			B

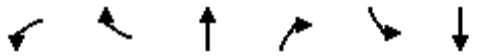
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	352	241	7	21	13
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	383	262	8	23	14
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		247	80			
pX, platoon unblocked	0.96				0.96	0.96
vC, conflicting volume	319				829	448
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	275				804	409
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	97
cM capacity (veh/h)	1190				294	526

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	399	270	37
Volume Left	16	0	23
Volume Right	0	8	14
cSH	1190	1700	353
Volume to Capacity	0.01	0.16	0.10
Queue Length 95th (m)	0.3	0.0	2.6
Control Delay (s)	0.5	0.0	16.4
Lane LOS	A		C
Approach Delay (s)	0.5	0.0	16.4
Approach LOS			C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	34	203
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	37	221
Pedestrians	20					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	315	20			20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315	20			20	
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	100			98	
cM capacity (veh/h)	663	1058			1596	

Direction, Lane #	SB 1
Volume Total	258
Volume Left	37
Volume Right	0
cSH	1596
Volume to Capacity	0.02
Queue Length 95th (m)	0.5
Control Delay (s)	1.2
Lane LOS	A
Approach Delay (s)	1.2
Approach LOS	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

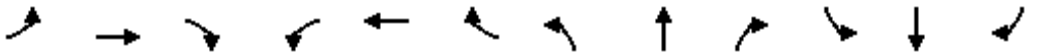
63: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.2	0.0	0.3	0.1	0.7
Delay / Veh (s)	2.2	0.5	7.0	10.1	3.3
Stop Delay (hr)	0.2	0.0	0.3	0.1	0.5
St Del/Veh (s)	1.5	0.1	5.6	9.2	2.4
Total Stops	24	0	82	19	125
Travel Dist (km)	48.1	15.3	15.7	2.0	81.1
Travel Time (hr)	1.5	0.4	0.8	0.2	2.9
Avg Speed (kph)	33	39	19	13	29
Fuel Used (l)	70.8	18.1	25.4	3.3	117.6
HC Emissions (g)	3	1	2	0	5
CO Emissions (g)	1030	283	473	25	1811
NOx Emissions (g)	10	2	5	0	17
Vehicles Entered	389	152	169	28	738
Vehicles Exited	388	152	171	29	740
Hourly Exit Rate	388	152	171	29	740
Input Volume	405	150	181	32	768
% of Volume	96	101	95	91	96
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	All
Total Delay (hr)	0.1	0.2	0.4	0.8
Delay / Veh (s)	1.8	2.2	22.6	4.0
Stop Delay (hr)	0.1	0.1	0.4	0.5
St Del/Veh (s)	1.1	0.6	20.4	2.7
Total Stops	18	20	70	108
Travel Dist (km)	22.5	26.1	9.0	57.5
Travel Time (hr)	0.8	1.0	0.7	2.5
Avg Speed (kph)	30	26	14	24
Fuel Used (l)	41.1	37.4	13.9	92.4
HC Emissions (g)	4	6	1	11
CO Emissions (g)	990	1207	248	2446
NOx Emissions (g)	12	16	3	31
Vehicles Entered	295	360	68	723
Vehicles Exited	295	360	68	723
Hourly Exit Rate	295	360	68	723
Input Volume	295	390	69	754
% of Volume	100	92	99	96
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Scenario C 2020 PM with modifications



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	496	316	36	17	121	76	58	349	34	85	185	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.91		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	1.00	1.00			0.96		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.96		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1709	1709			1572		1771	1782		1572	1559	
Flt Permitted	0.33	1.00			0.88		0.12	1.00		0.31	1.00	
Satd. Flow (perm)	585	1709			1399		219	1782		514	1559	
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	528	363	49	39	136	85	74	426	49	99	206	575
RTOR Reduction (vph)	0	6	0	0	22	0	0	5	0	0	125	0
Lane Group Flow (vph)	528	406	0	0	238	0	74	470	0	99	656	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			16.0		32.0	32.0		32.0	32.0	
Effective Green, g (s)	36.0	38.0			18.0		34.0	34.0		34.0	34.0	
Actuated g/C Ratio	0.45	0.48			0.22		0.42	0.42		0.42	0.42	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	488	812			315		93	757		218	663	
v/s Ratio Prot	c0.22	0.24						0.26			c0.42	
v/s Ratio Perm	c0.27				0.17		0.34			0.19		
v/c Ratio	1.08	0.50			0.76		0.80	0.62		0.45	0.99	
Uniform Delay, d1	19.5	14.5			29.0		20.0	18.0		16.4	22.8	
Progression Factor	0.90	0.90			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	53.6	1.1			15.5		49.1	3.8		6.7	32.4	
Delay (s)	71.1	14.1			44.5		69.1	21.8		23.1	55.2	
Level of Service	E	B			D		E	C		C	E	
Approach Delay (s)		46.2			44.5			28.1			51.6	
Approach LOS		D			D			C			D	

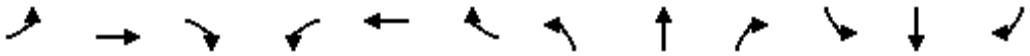
Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	688	133	81	587	249	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.95			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1723			3637	1771	1485
Flt Permitted	1.00			0.61	0.95	1.00
Satd. Flow (perm)	1723			2231	1771	1485
Peak-hour factor, PHF	0.87	0.92	0.87	0.87	0.92	0.93
Adj. Flow (vph)	791	145	93	675	271	417
RTOR Reduction (vph)	8	0	0	0	0	100
Lane Group Flow (vph)	928	0	0	768	271	317
Confl. Peds. (#/hr)		75	75		9	3
Confl. Bikes (#/hr)		14				9
Heavy Vehicles (%)	1%	2%	0%	2%	1%	3%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	46.0			46.0	20.0	20.0
Effective Green, g (s)	49.0			49.0	23.0	23.0
Actuated g/C Ratio	0.61			0.61	0.29	0.29
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1055			1366	509	427
v/s Ratio Prot	c0.54				0.15	
v/s Ratio Perm				0.34		c0.21
v/c Ratio	0.88			0.56	0.53	0.74
Uniform Delay, d1	13.0			9.2	24.0	25.8
Progression Factor	0.96			1.34	1.00	1.00
Incremental Delay, d2	9.8			0.6	4.0	11.0
Delay (s)	22.4			12.9	27.9	36.8
Level of Service	C			B	C	D
Approach Delay (s)	22.4			12.9	33.3	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

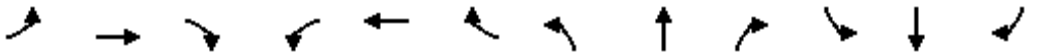
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	209	58	45	332	186	84	243	48	43	143	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.6	3.7	3.7	3.7	3.7	3.7	4.6	3.7	3.0	4.8	3.7
Grade (%)		3%			7%			-3%			3%	
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	
Frpb, ped/bikes		0.94			1.00	0.59		0.94			0.84	
Flpb, ped/bikes		0.95			1.00	1.00		1.00			1.00	
Frt		0.98			1.00	0.85		0.98			0.96	
Flt Protected		0.98			0.99	1.00		0.99			0.99	
Satd. Flow (prot)		1751			1803	907		1913			1666	
Flt Permitted		0.59			0.85	1.00		0.75			0.81	
Satd. Flow (perm)		1050			1549	907		1462			1363	
Peak-hour factor, PHF	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Adj. Flow (vph)	217	275	73	69	346	224	120	286	53	64	170	92
RTOR Reduction (vph)	0	6	0	0	0	58	0	5	0	0	15	0
Lane Group Flow (vph)	0	559	0	0	415	166	0	454	0	0	311	0
Confl. Peds. (#/hr)	80		97	97		80	154		135	135		154
Confl. Bikes (#/hr)			6			2			2			1
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		48.0			48.0	48.0		30.0			30.0	
Effective Green, g (s)		50.0			50.0	50.0		32.0			32.0	
Actuated g/C Ratio		0.56			0.56	0.56		0.36			0.36	
Clearance Time (s)		6.0			6.0	6.0		6.0			6.0	
Lane Grp Cap (vph)		583			861	504		520			485	
v/s Ratio Prot												
v/s Ratio Perm		c0.53			0.27	0.18		c0.31			0.23	
v/c Ratio		0.96			0.48	0.33		0.87			0.64	
Uniform Delay, d1		19.0			12.1	10.9		27.1			24.2	
Progression Factor		1.00			1.00	1.00		1.00			0.98	
Incremental Delay, d2		28.5			1.9	1.7		18.1			5.5	
Delay (s)		47.5			14.1	12.6		45.2			29.1	
Level of Service		D			B	B		D			C	
Approach Delay (s)		47.5			13.6			45.2			29.1	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

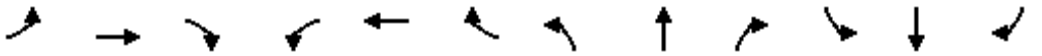
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	193	56	96	217	417	53	613	173	275	273	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1732	1498		1855	1355	1668	1799	
Flt Permitted		0.98			0.69	1.00		0.95	1.00	0.11	1.00	
Satd. Flow (perm)		1920			1216	1498		1770	1355	190	1799	
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	208	60	97	219	421	55	639	180	281	279	16
RTOR Reduction (vph)	0	12	0	0	0	229	0	0	99	0	3	0
Lane Group Flow (vph)	0	269	0	0	316	192	0	694	81	281	292	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.0			20.0	20.0		33.0	33.0	46.0	46.0	
Effective Green, g (s)		23.0			23.0	23.0		36.0	36.0	46.0	49.0	
Actuated g/C Ratio		0.29			0.29	0.29		0.45	0.45	0.57	0.61	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		552			350	431		797	610	276	1102	
v/s Ratio Prot										c0.11	0.16	
v/s Ratio Perm		0.14			c0.26	0.13		0.39	0.06	c0.47		
v/c Ratio		0.49			0.90	0.44		0.87	0.13	1.02	0.27	
Uniform Delay, d1		23.6			27.4	23.3		19.9	12.9	21.8	7.2	
Progression Factor		1.00			0.74	0.75		0.80	1.17	1.00	1.00	
Incremental Delay, d2		3.1			25.9	2.9		7.8	0.3	58.9	0.6	
Delay (s)		26.7			46.4	20.2		23.8	15.3	80.7	7.8	
Level of Service		C			D	C		C	B	F	A	
Approach Delay (s)		26.7			31.4			22.0			43.3	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

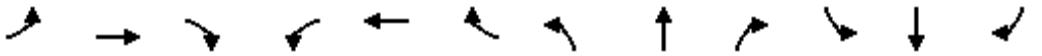
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	257	97	87	439	75	124	478	167	64	235	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.92			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1705	1710		1680	1892	1316		3050			3424	1386
Flt Permitted	0.31	1.00		0.30	1.00	1.00		0.77			0.60	1.00
Satd. Flow (perm)	558	1710		538	1892	1316		2382			2071	1386
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	112	317	143	102	453	95	170	525	226	107	264	60
RTOR Reduction (vph)	0	20	0	0	0	45	0	40	0	0	0	30
Lane Group Flow (vph)	112	440	0	102	453	50	0	882	0	0	371	30
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	223	684		215	757	526		1191			1036	693
v/s Ratio Prot		c0.26			0.24							
v/s Ratio Perm	0.20			0.19		0.04		c0.37			0.18	0.02
v/c Ratio	0.50	0.64		0.47	0.60	0.10		0.74			0.36	0.04
Uniform Delay, d1	18.0	19.4		17.8	18.9	15.0		15.9			12.2	10.2
Progression Factor	1.01	1.01		1.00	1.00	1.00		0.88			0.92	0.90
Incremental Delay, d2	7.8	4.6		7.3	3.5	0.4		3.7			0.9	0.1
Delay (s)	26.1	24.2		25.1	22.4	15.3		17.6			12.2	9.3
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		24.6			21.8			17.6			11.8	
Approach LOS		C			C			B			B	

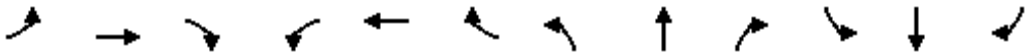
Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



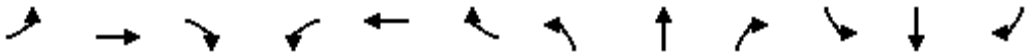
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	244	61	31	230	127	121	612	107	104	279	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.87		1.00	1.00	0.56
Flpb, ped/bikes	0.83	1.00	1.00		0.96	1.00	0.77	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1344	1448	354		1532	684	1332	1546		1723	1739	855
Flt Permitted	0.36	1.00	1.00		0.93	1.00	0.53	1.00		0.19	1.00	1.00
Satd. Flow (perm)	514	1448	354		1439	684	748	1546		353	1739	855
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	84	274	73	40	307	149	146	644	134	133	310	84
RTOR Reduction (vph)	0	0	49	0	0	21	0	4	0	0	0	0
Lane Group Flow (vph)	84	274	24	0	347	128	146	774	0	133	310	84
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	23.0	23.0	23.0		23.0	23.0	43.0	43.0		43.0	43.0	43.0
Effective Green, g (s)	26.0	26.0	26.0		26.0	26.0	46.0	46.0		46.0	46.0	46.0
Actuated g/C Ratio	0.32	0.32	0.32		0.32	0.32	0.57	0.57		0.57	0.57	0.57
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	167	471	115		468	222	430	889		203	1000	492
v/s Ratio Prot		0.19						c0.50			0.18	
v/s Ratio Perm	0.16		0.07		c0.24	0.19	0.20			0.38		0.10
v/c Ratio	0.50	0.58	0.21		0.74	0.58	0.34	0.87		0.66	0.31	0.17
Uniform Delay, d1	21.8	22.5	19.5		24.0	22.4	9.0	14.5		11.6	8.8	8.0
Progression Factor	0.99	0.99	1.31		0.82	0.76	1.14	1.22		0.82	0.75	0.73
Incremental Delay, d2	9.5	4.7	3.7		9.7	10.0	2.0	10.9		14.6	0.8	0.7
Delay (s)	31.0	27.0	29.3		29.3	27.0	12.2	28.5		24.1	7.4	6.6
Level of Service	C	C	C		C	C	B	C		C	A	A
Approach Delay (s)		28.2			28.6			26.0			11.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



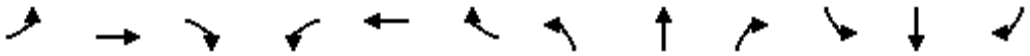
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	302	71	43	353	0	0	0	0	12	76	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						1.00	
Frpb, ped/bikes		0.77		1.00	1.00						0.75	
Flpb, ped/bikes		1.00		0.72	1.00						0.91	
Frt		0.97		1.00	1.00						0.95	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1140		1138	1598						1374	
Flt Permitted		1.00		0.42	1.00						0.99	
Satd. Flow (perm)		1140		505	1598						1374	
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	0	336	115	77	401	0	0	0	0	31	112	92
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	436	0	77	401	0	0	0	0	0	226	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		44.0		44.0	44.0						24.0	
Effective Green, g (s)		46.0		46.0	46.0						26.0	
Actuated g/C Ratio		0.57		0.57	0.57						0.32	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Lane Grp Cap (vph)		656		290	919						447	
v/s Ratio Prot		c0.38			0.25							
v/s Ratio Perm				0.15							0.16	
v/c Ratio		0.66		0.27	0.44						0.51	
Uniform Delay, d1		11.7		8.5	9.6						21.8	
Progression Factor		0.92		1.00	1.00						0.96	
Incremental Delay, d2		3.9		2.2	1.5						4.0	
Delay (s)		14.7		10.8	11.2						24.8	
Level of Service		B		B	B						C	
Approach Delay (s)		14.7			11.1			0.0			24.8	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	286	62	152	287	26	167	382	237	9	226	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.84		1.00	0.94		1.00	0.83			0.80	
Flpb, ped/bikes		0.96		0.65	1.00		1.00	1.00			1.00	
Frt		0.97		1.00	0.99		1.00	0.94			0.96	
Flt Protected		0.99		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)		2322		1091	1474		1635	1470			1440	
Flt Permitted		0.85		0.45	1.00		0.47	1.00			0.97	
Satd. Flow (perm)		1979		515	1474		807	1470			1396	
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	60	304	85	217	334	28	232	415	255	10	246	109
RTOR Reduction (vph)	0	23	0	0	3	0	0	15	0	0	13	0
Lane Group Flow (vph)	0	426	0	217	359	0	232	655	0	0	352	0
Confl. Peds. (#/hr)	436		420	420		436	271		340	340		271
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		38.0		38.0	38.0		40.0	40.0			40.0	
Effective Green, g (s)		40.0		40.0	40.0		42.0	42.0			42.0	
Actuated g/C Ratio		0.44		0.44	0.44		0.47	0.47			0.47	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)		880		229	655		377	686			651	
v/s Ratio Prot					0.24			c0.45				
v/s Ratio Perm		0.22		c0.42			0.29				0.25	
v/c Ratio		0.48		0.95	0.55		0.62	0.95			0.54	
Uniform Delay, d1		17.7		24.0	18.4		18.0	23.1			17.1	
Progression Factor		1.00		1.00	1.00		0.85	0.80			1.00	
Incremental Delay, d2		1.9		47.3	3.3		6.1	21.8			3.2	
Delay (s)		19.6		71.3	21.6		21.3	40.4			20.3	
Level of Service		B		E	C		C	D			C	
Approach Delay (s)		19.6			40.2			35.5			20.3	
Approach LOS		B			D			D			C	

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	47	0	40	74	175	54	484	87	134	176	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			3%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.76			0.92			0.86	
Flpb, ped/bikes		1.00			0.99			0.99			1.00	
Frt		1.00			0.92			0.98			0.96	
Flt Protected		0.98			0.99			1.00			0.98	
Satd. Flow (prot)		1845			1285			1674			1512	
Flt Permitted		0.79			0.95			0.93			0.66	
Satd. Flow (perm)		1481			1228			1559			1013	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	51	0	43	80	190	59	526	95	146	191	137
RTOR Reduction (vph)	0	0	0	0	62	0	0	7	0	0	16	0
Lane Group Flow (vph)	0	87	0	0	251	0	0	673	0	0	458	0
Confl. Peds. (#/hr)	78		19	19		78	94		157	157		94
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		25.0			25.0			53.0			53.0	
Effective Green, g (s)		27.0			27.0			55.0			55.0	
Actuated g/C Ratio		0.30			0.30			0.61			0.61	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		444			368			953			619	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.20			0.43			c0.45	
v/c Ratio		0.20			0.68			0.71			0.74	
Uniform Delay, d1		23.4			27.7			12.0			12.4	
Progression Factor		1.00			1.00			0.84			1.52	
Incremental Delay, d2		1.0			9.9			2.8			5.5	
Delay (s)		24.4			37.6			12.9			24.5	
Level of Service		C			D			B			C	
Approach Delay (s)		24.4			37.6			12.9			24.5	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

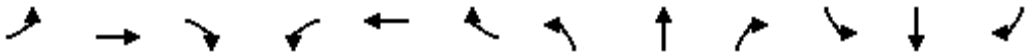
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	516	65	92	598	0	0
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	586	89	156	695	0	0
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.87		0.92	0.87
vC, conflicting volume			710		1328	669
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			595		937	547
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		100	100
cM capacity (veh/h)			853		197	418

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	675	388	464
Volume Left	0	156	0
Volume Right	89	0	0
cSH	1700	853	1700
Volume to Capacity	0.40	0.18	0.27
Queue Length 95th (m)	0.0	5.1	0.0
Control Delay (s)	0.0	5.4	0.0
Lane LOS		A	
Approach Delay (s)	0.0	2.4	
Approach LOS			

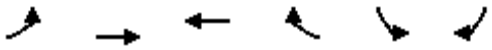
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	13	162	0	43	0	36	38	81	63
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			4%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	176	0	47	0	39	41	88	68
Pedestrians		45			51			36			74	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					160							
pX, platoon unblocked												
vC, conflicting volume	250			36			398	314	87	368	314	295
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	250			36			398	314	87	368	314	295
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			88	100	96	91	84	90
cM capacity (veh/h)	1232			1526			380	540	900	465	541	670

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	190	86	198
Volume Left	0	14	47	41
Volume Right	0	0	39	68
cSH	1700	1526	516	559
Volume to Capacity	0.00	0.01	0.17	0.35
Queue Length 95th (m)	0.0	0.2	4.5	12.1
Control Delay (s)	0.0	0.6	13.4	14.9
Lane LOS		A	B	B
Approach Delay (s)	0.0	0.6	13.4	14.9
Approach LOS			B	B

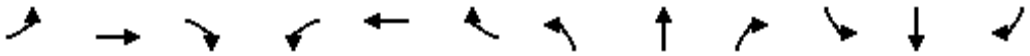
Intersection Summary			
Average Delay	8.9		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	358	526	8	26	42
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	389	572	9	28	46
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		87	239			
pX, platoon unblocked	0.96				0.96	0.96
vC, conflicting volume	664				1091	660
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	633				1076	629
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				87	89
cM capacity (veh/h)	850				212	432

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	580	74
Volume Left	20	0	28
Volume Right	0	9	46
cSH	850	1700	309
Volume to Capacity	0.02	0.34	0.24
Queue Length 95th (m)	0.5	0.0	7.0
Control Delay (s)	0.7	0.0	20.3
Lane LOS	A		C
Approach Delay (s)	0.7	0.0	20.3
Approach LOS			C

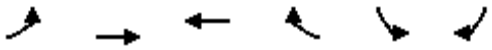
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	24	54	7	12	163	79	17	37	20	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			2%			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)	26	59	8	13	177	86	18	40	22	0	0	0
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					81							
pX, platoon unblocked												
vC, conflicting volume	331			114			484	520	170	530	481	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	331			114			484	520	170	530	481	363
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			96	91	97	100	100	100
cM capacity (veh/h)	1228			1414			419	428	796	373	451	638

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	92	276	80
Volume Left	26	13	18
Volume Right	8	86	22
cSH	1228	1414	486
Volume to Capacity	0.02	0.01	0.17
Queue Length 95th (m)	0.5	0.2	4.5
Control Delay (s)	2.4	0.4	13.9
Lane LOS	A	A	B
Approach Delay (s)	2.4	0.4	13.9
Approach LOS			B

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	35.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	201	354	361	165	30	129
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Peak Hour Factor	0.94	0.91	0.85	0.96	0.92	0.92
Hourly flow rate (vph)	214	389	425	172	33	140
Pedestrians		16	33		435	
Lane Width (m)		3.0	3.0		3.0	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		1	2		30	
Right turn flare (veh)						3
Median type		None	None			
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked					0.97	
vC, conflicting volume	1032				1709	876
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1032				1717	876
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	54				8	41
cM capacity (veh/h)	462				36	239

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	214	389	425	172	173
Volume Left	214	0	0	0	33
Volume Right	0	0	0	172	140
cSH	462	1700	1700	1700	170
Volume to Capacity	0.46	0.23	0.25	0.10	1.02
Queue Length 95th (m)	18.2	0.0	0.0	0.0	62.5
Control Delay (s)	19.3	0.0	0.0	0.0	128.3
Lane LOS	C				F
Approach Delay (s)	6.9		0.0		128.3
Approach LOS					F

Intersection Summary			
Average Delay	19.2		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	425	82	38	365	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	462	89	41	397	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.86		0.92	0.86
vC, conflicting volume			551		1286	507
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			395		974	343
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			999		195	601

Direction, Lane #	EB 1	WB 1
Volume Total	551	438
Volume Left	0	41
Volume Right	89	0
cSH	1700	999
Volume to Capacity	0.32	0.04
Queue Length 95th (m)	0.0	1.0
Control Delay (s)	0.0	1.3
Lane LOS		A
Approach Delay (s)	0.0	1.3
Approach LOS		

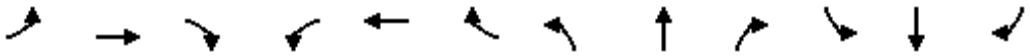
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	60	377	536	0	0	284
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	410	583	0	0	309
Pedestrians	52		163			169
Lane Width (m)	3.0		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	1106	804			635	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	994	659			454	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	0			100	
cM capacity (veh/h)	189	319			891	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	65	410	583	309
Volume Left	65	0	0	0
Volume Right	0	410	0	0
cSH	189	319	1700	891
Volume to Capacity	0.34	1.28	0.34	0.00
Queue Length 95th (m)	11.0	146.8	0.0	0.0
Control Delay (s)	33.7	183.5	0.0	0.0
Lane LOS	D	F		
Approach Delay (s)	162.9		0.0	0.0
Approach LOS	F			

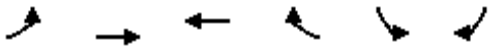
Intersection Summary			
Average Delay	56.6		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	16	249	0	52	0	0	0	31	80
Sign Control		Free			Free			Stop			Stop	
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)	0	0	0	17	271	0	57	0	0	0	34	87
Pedestrians		28			32			60			84	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					237							
pX, platoon unblocked												
vC, conflicting volume	355			60			497	449	92	421	449	383
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	355			60			497	449	92	421	449	383
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			83	100	100	100	92	86
cM capacity (veh/h)	1117			1464			325	439	891	441	439	602

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	288	57	121
Volume Left	0	17	57	0
Volume Right	0	0	0	87
cSH	1700	1464	325	546
Volume to Capacity	0.00	0.01	0.17	0.22
Queue Length 95th (m)	0.0	0.3	4.7	6.4
Control Delay (s)	0.0	0.6	18.4	13.5
Lane LOS		A	C	B
Approach Delay (s)	0.0	0.6	18.4	13.5
Approach LOS			C	B

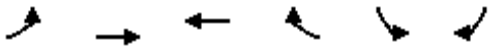
Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	51	409	471	8	23	55
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	445	512	9	25	60
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		168	159			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	552				1163	660
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	472				1134	589
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				86	85
cM capacity (veh/h)	979				180	412

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	500	521	85
Volume Left	55	0	25
Volume Right	0	9	60
cSH	979	1700	298
Volume to Capacity	0.06	0.31	0.28
Queue Length 95th (m)	1.4	0.0	8.7
Control Delay (s)	1.6	0.0	21.8
Lane LOS	A		C
Approach Delay (s)	1.6	0.0	21.8
Approach LOS			C

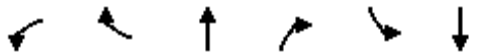
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	55	344	475	16	52	19
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	374	516	17	57	21
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		247	79			
pX, platoon unblocked	0.89				0.89	0.89
vC, conflicting volume	583				1166	707
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	466				1124	606
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				66	94
cM capacity (veh/h)	931				165	374

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	434	534	77
Volume Left	60	0	57
Volume Right	0	17	21
cSH	931	1700	194
Volume to Capacity	0.06	0.31	0.40
Queue Length 95th (m)	1.6	0.0	13.4
Control Delay (s)	1.9	0.0	35.2
Lane LOS	A		E
Approach Delay (s)	1.9	0.0	35.2
Approach LOS			E

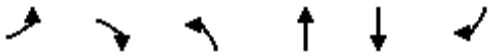
Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	141	233
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	153	253
Pedestrians	102					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	662	102			102	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	662	102			102	
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	100			90	
cM capacity (veh/h)	383	953			1490	

Direction, Lane #	SB 1
Volume Total	407
Volume Left	153
Volume Right	0
cSH	1490
Volume to Capacity	0.10
Queue Length 95th (m)	2.6
Control Delay (s)	3.5
Lane LOS	A
Approach Delay (s)	3.5
Approach LOS	

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	85	19	4	290	140	64
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	21	4	315	152	70
Pedestrians	141					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	12					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	652	328	363			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652	328	363			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	97	100			
cM capacity (veh/h)	379	627	1051			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	113	320	222
Volume Left	92	4	0
Volume Right	21	0	70
cSH	408	1051	1700
Volume to Capacity	0.28	0.00	0.13
Queue Length 95th (m)	8.5	0.1	0.0
Control Delay (s)	17.2	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	17.2	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	28	362	84	38	304
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)	33	30	393	91	41	330
Pedestrians			75			81
Lane Width (m)			3.7			3.7
Walking Speed (m/s)			1.2			1.2
Percent Blockage			6			7
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			58			237
pX, platoon unblocked						
vC, conflicting volume	927	520			485	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	927	520			485	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	94			96	
cM capacity (veh/h)	268	517			1078	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	63	485	372
Volume Left	33	0	41
Volume Right	30	91	0
cSH	349	1700	1078
Volume to Capacity	0.18	0.29	0.04
Queue Length 95th (m)	4.9	0.0	0.9
Control Delay (s)	17.6	0.0	1.3
Lane LOS	C		A
Approach Delay (s)	17.6	0.0	1.3
Approach LOS	C		

Intersection Summary			
Average Delay		1.7	
Intersection Capacity Utilization		65.1%	ICU Level of Service C
Analysis Period (min)		15	

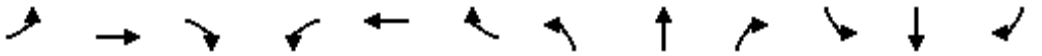
174: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.1	0.1	2.4	0.7	3.3
Delay / Veh (s)	1.0	1.2	39.2	17.6	11.3
Stop Delay (hr)	0.0	0.0	2.3	0.7	3.0
St Del/Veh (s)	0.5	0.1	37.4	16.9	10.3
Total Stops	4	0	215	116	335
Travel Dist (km)	42.6	34.6	24.9	9.1	111.3
Travel Time (hr)	1.2	0.9	3.1	1.0	6.2
Avg Speed (kph)	36	40	8	9	18
Fuel Used (l)	62.9	33.8	46.8	17.0	160.5
HC Emissions (g)	2	2	1	0	5
CO Emissions (g)	950	453	329	131	1864
NOx Emissions (g)	9	5	3	2	18
Vehicles Entered	345	335	219	139	1038
Vehicles Exited	346	334	216	139	1035
Hourly Exit Rate	346	334	216	139	1035
Input Volume	340	397	231	138	1106
% of Volume	102	84	94	101	94
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	All
Total Delay (hr)	0.8	0.5	1.7	3.0
Delay / Veh (s)	8.3	3.2	35.6	10.5
Stop Delay (hr)	0.6	0.1	1.6	2.4
St Del/Veh (s)	6.7	1.0	33.5	8.5
Total Stops	86	54	185	325
Travel Dist (km)	26.1	38.6	23.2	87.8
Travel Time (hr)	1.6	1.5	2.4	5.5
Avg Speed (kph)	18	25	10	17
Fuel Used (l)	46.7	56.7	40.8	144.1
HC Emissions (g)	9	4	1	13
CO Emissions (g)	1658	1046	365	3069
NOx Emissions (g)	22	13	3	38
Vehicles Entered	345	503	176	1024
Vehicles Exited	346	504	175	1025
Hourly Exit Rate	346	504	175	1025
Input Volume	351	554	172	1077
% of Volume	99	91	102	95
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Scenario D 2020 AM with modifications



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	262	347	37	7	36	34	9	165	25	224	281	508
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99			0.94		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	0.95	1.00			0.99		1.00	1.00		0.97	1.00	
Frt	1.00	0.98			0.95		1.00	0.98		1.00	0.90	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1625	1786			1685		1807	1806		1635	1664	
Flt Permitted	0.60	1.00			0.89		0.11	1.00		0.58	1.00	
Satd. Flow (perm)	1023	1786			1513		211	1806		1001	1664	
Peak-hour factor, PHF	0.91	0.94	0.70	0.40	0.86	0.83	0.50	0.80	0.69	0.94	0.83	0.86
Adj. Flow (vph)	288	369	53	18	42	41	18	206	36	238	339	591
RTOR Reduction (vph)	0	7	0	0	31	0	0	9	0	0	87	0
Lane Group Flow (vph)	288	415	0	0	70	0	18	234	0	238	843	0
Confl. Peds. (#/hr)	49		52	52		49	27		25	25		27
Confl. Bikes (#/hr)			16						4			25
Heavy Vehicles (%)	2%	0%	6%	0%	0%	0%	0%	0%	5%	1%	3%	2%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.0	26.0			16.0		34.0	34.0		34.0	34.0	
Effective Green, g (s)	26.0	28.0			18.0		36.0	36.0		36.0	36.0	
Actuated g/C Ratio	0.36	0.39			0.25		0.50	0.50		0.50	0.50	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	420	695			378		106	903		501	832	
v/s Ratio Prot	c0.06	0.23						0.13			c0.51	
v/s Ratio Perm	c0.19				0.05		0.09			0.24		
v/c Ratio	0.69	0.60			0.19		0.17	0.26		0.48	1.01	
Uniform Delay, d1	20.2	17.5			21.2		9.8	10.3		11.8	18.0	
Progression Factor	1.00	1.00			1.43		1.04	1.06		0.92	0.75	
Incremental Delay, d2	8.8	3.8			1.1		3.4	0.7		2.5	30.8	
Delay (s)	29.0	21.3			31.5		13.7	11.6		13.4	44.2	
Level of Service	C	C			C		B	B		B	D	
Approach Delay (s)		24.4			31.5			11.8			37.9	
Approach LOS		C			C			B			D	

Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	561	199	152	424	97	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.94			1.00	1.00	0.95
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.96			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1667			3605	1789	1528
Flt Permitted	1.00			0.56	0.95	1.00
Satd. Flow (perm)	1667			2057	1789	1528
Peak-hour factor, PHF	0.91	0.82	0.87	0.82	0.85	0.88
Adj. Flow (vph)	616	243	175	517	114	173
RTOR Reduction (vph)	18	0	0	0	0	138
Lane Group Flow (vph)	841	0	0	692	114	35
Confl. Peds. (#/hr)		44	44		4	5
Confl. Bikes (#/hr)		31				2
Heavy Vehicles (%)	2%	1%	2%	2%	0%	0%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	53.0			53.0	13.0	13.0
Effective Green, g (s)	56.0			56.0	16.0	16.0
Actuated g/C Ratio	0.70			0.70	0.20	0.20
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1167			1440	358	306
v/s Ratio Prot	c0.50				c0.06	
v/s Ratio Perm				0.34		0.02
v/c Ratio	0.72			0.48	0.32	0.11
Uniform Delay, d1	7.3			5.4	27.3	26.2
Progression Factor	1.30			1.00	1.00	1.00
Incremental Delay, d2	3.1			1.2	2.3	0.7
Delay (s)	12.6			6.6	29.7	26.9
Level of Service	B			A	C	C
Approach Delay (s)	12.6			6.6	28.0	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	101	225	50	44	141	47	36	141	54	148	180	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.6	3.7	3.7	3.7	3.7	3.7	4.6	3.7	3.0	4.8	3.7
Grade (%)		3%			7%			-3%			3%	
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	
Frpb, ped/bikes		0.95			1.00	0.67		0.88			0.94	
Flpb, ped/bikes		0.94			1.00	1.00		0.97			0.89	
Frt		0.98			1.00	0.85		0.97			0.98	
Flt Protected		0.99			0.99	1.00		0.99			0.98	
Satd. Flow (prot)		1760			1796	1041		1725			1679	
Flt Permitted		0.86			0.87	1.00		0.91			0.78	
Satd. Flow (perm)		1532			1576	1041		1575			1336	
Peak-hour factor, PHF	0.97	0.97	0.97	0.94	0.94	0.94	0.89	0.89	0.89	0.95	0.95	0.95
Adj. Flow (vph)	104	232	52	47	150	50	40	158	61	156	189	47
RTOR Reduction (vph)	0	8	0	0	0	30	0	16	0	0	7	0
Lane Group Flow (vph)	0	380	0	0	197	20	0	243	0	0	385	0
Confl. Peds. (#/hr)	80		97	97		80	154		135	135		154
Confl. Bikes (#/hr)			6			2			2			1
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		26.0			26.0	26.0		32.0			32.0	
Effective Green, g (s)		28.0			28.0	28.0		34.0			34.0	
Actuated g/C Ratio		0.40			0.40	0.40		0.49			0.49	
Clearance Time (s)		6.0			6.0	6.0		6.0			6.0	
Lane Grp Cap (vph)		613			630	416		765			649	
v/s Ratio Prot												
v/s Ratio Perm		c0.25			0.12	0.02		0.15			c0.29	
v/c Ratio		0.62			0.31	0.05		0.32			0.59	
Uniform Delay, d1		16.8			14.4	12.8		10.9			13.0	
Progression Factor		1.00			1.00	1.00		1.00			0.72	
Incremental Delay, d2		4.7			1.3	0.2		1.1			3.7	
Delay (s)		21.4			15.7	13.1		12.0			13.1	
Level of Service		C			B	B		B			B	
Approach Delay (s)		21.4			15.2			12.0			13.1	
Approach LOS		C			B			B			B	

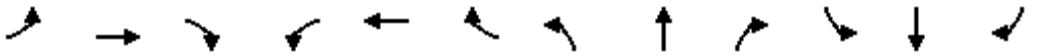
Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	218	39	109	166	140	17	257	115	488	351	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98			1.00	0.96		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	0.98	1.00	
Frt		0.98			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2002			1715	1545		1857	1350	1642	1812	
Flt Permitted		0.98			0.64	1.00		0.96	1.00	0.31	1.00	
Satd. Flow (perm)		1968			1119	1545		1790	1350	539	1812	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	12	237	42	115	175	147	19	286	128	530	382	7
RTOR Reduction (vph)	0	8	0	0	0	101	0	0	90	0	1	0
Lane Group Flow (vph)	0	283	0	0	290	46	0	305	38	530	388	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			4			2			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		22.0			22.0	22.0		21.0	21.0	44.0	44.0	
Effective Green, g (s)		25.0			25.0	25.0		24.0	24.0	44.0	47.0	
Actuated g/C Ratio		0.31			0.31	0.31		0.30	0.30	0.55	0.59	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		615			350	483		537	405	558	1065	
v/s Ratio Prot										c0.23	0.21	
v/s Ratio Perm		0.14			c0.26	0.03		0.17	0.03	c0.30		
v/c Ratio		0.46			0.83	0.10		0.57	0.09	0.95	0.36	
Uniform Delay, d1		22.1			25.5	19.5		23.6	20.2	13.7	8.7	
Progression Factor		1.00			0.87	0.54		0.93	1.39	1.00	1.00	
Incremental Delay, d2		2.5			18.3	0.4		3.5	0.4	27.5	1.0	
Delay (s)		24.6			40.3	10.8		25.4	28.4	41.2	9.6	
Level of Service		C			D	B		C	C	D	A	
Approach Delay (s)		24.6			30.4			26.3			27.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

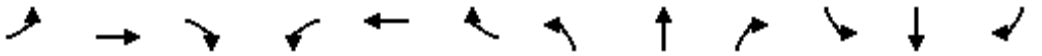
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	212	188	58	186	35	97	316	105	106	373	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.88		0.96			1.00	0.93
Flpb, ped/bikes	0.92	1.00		0.95	1.00	1.00		0.99			0.98	1.00
Frt	1.00	0.93		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1592	1659		1681	1874	1369		3215			3486	1527
Flt Permitted	0.57	1.00		0.30	1.00	1.00		0.66			0.66	1.00
Satd. Flow (perm)	958	1659		538	1874	1369		2156			2338	1527
Peak-hour factor, PHF	0.82	0.84	0.86	0.88	0.84	0.71	0.62	0.80	0.92	0.82	0.82	0.54
Adj. Flow (vph)	49	252	219	66	221	49	156	395	114	129	455	81
RTOR Reduction (vph)	0	39	0	0	0	29	0	22	0	0	0	42
Lane Group Flow (vph)	49	432	0	66	221	20	0	643	0	0	584	39
Confl. Peds. (#/hr)	104		118	118		104	74		164	164		74
Confl. Bikes (#/hr)			4			11			14			3
Heavy Vehicles (%)	6%	1%	1%	2%	1%	3%	1%	4%	1%	0%	3%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.0	31.0		31.0	31.0	31.0		37.0			37.0	37.0
Effective Green, g (s)	33.0	33.0		33.0	33.0	33.0		39.0			39.0	39.0
Actuated g/C Ratio	0.41	0.41		0.41	0.41	0.41		0.49			0.49	0.49
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	395	684		222	773	565		1051			1140	744
v/s Ratio Prot		c0.26			0.12							
v/s Ratio Perm	0.05			0.12		0.01		c0.30			0.25	0.03
v/c Ratio	0.12	0.63		0.30	0.29	0.04		0.61			0.51	0.05
Uniform Delay, d1	14.6	18.7		15.7	15.7	14.0		15.0			14.0	10.8
Progression Factor	1.01	1.01		1.00	1.00	1.00		0.65			0.86	0.62
Incremental Delay, d2	0.6	4.4		3.4	0.9	0.1		2.4			1.5	0.1
Delay (s)	15.3	23.2		19.1	16.6	14.1		12.2			13.5	6.9
Level of Service	B	C		B	B	B		B			B	A
Approach Delay (s)		22.4			16.7			12.2			12.7	
Approach LOS		C			B			B			B	

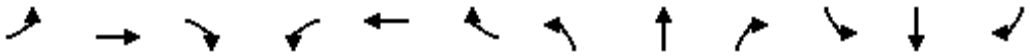
Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



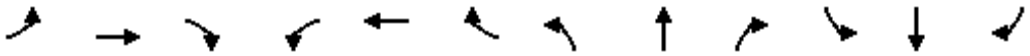
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	206	97	35	175	75	53	408	72	81	396	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.39		1.00	0.57	1.00	0.89		1.00	1.00	0.68
Flpb, ped/bikes	0.76	1.00	1.00		0.94	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1209	1564	545		1316	802	1658	1571		1790	1773	1021
Flt Permitted	0.54	1.00	1.00		0.91	1.00	0.38	1.00		0.30	1.00	1.00
Satd. Flow (perm)	688	1564	545		1211	802	667	1571		569	1773	1021
Peak-hour factor, PHF	0.61	0.84	0.83	0.86	0.90	0.83	0.73	0.87	0.69	0.67	0.84	0.92
Adj. Flow (vph)	130	245	117	41	194	90	73	469	104	121	471	53
RTOR Reduction (vph)	0	0	73	0	0	56	0	10	0	0	0	17
Lane Group Flow (vph)	130	245	44	0	235	34	73	563	0	121	471	36
Confl. Peds. (#/hr)	340		225	225		340	125		214	214		125
Confl. Bikes (#/hr)						2			2			15
Heavy Vehicles (%)	4%	12%	11%	20%	27%	8%	9%	3%	14%	3%	1%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	27.0	27.0	27.0		27.0	27.0	39.0	39.0		39.0	39.0	39.0
Effective Green, g (s)	30.0	30.0	30.0		30.0	30.0	42.0	42.0		42.0	42.0	42.0
Actuated g/C Ratio	0.38	0.38	0.38		0.38	0.38	0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	258	587	204		454	301	350	825		299	931	536
v/s Ratio Prot		0.16						c0.36			0.27	
v/s Ratio Perm	0.19		0.08		c0.19	0.04	0.11			0.21		0.04
v/c Ratio	0.50	0.42	0.22		0.52	0.11	0.21	0.68		0.40	0.51	0.07
Uniform Delay, d1	19.3	18.5	17.0		19.4	16.3	10.1	14.1		11.5	12.3	9.4
Progression Factor	1.00	1.00	1.00		0.82	0.45	1.12	1.27		0.76	0.77	0.61
Incremental Delay, d2	6.9	2.2	2.4		4.1	0.7	1.3	4.3		3.8	1.8	0.2
Delay (s)	26.1	20.7	19.4		20.1	8.2	12.7	22.2		12.5	11.3	5.9
Level of Service	C	C	B		C	A	B	C		B	B	A
Approach Delay (s)		21.8			16.8			21.1			11.1	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



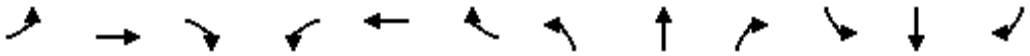
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	275	61	0	220	0	0	0	0	25	84	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		0.87			1.00						0.81	
Flpb, ped/bikes		1.00			1.00						0.92	
Frt		0.97			1.00						0.95	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1369			1364						1518	
Flt Permitted		1.00			1.00						0.99	
Satd. Flow (perm)		1369			1364						1518	
Peak-hour factor, PHF	0.53	0.84	0.74	0.60	0.86	0.75	0.38	0.86	0.75	0.75	0.77	0.72
Adj. Flow (vph)	0	327	82	0	256	0	0	0	0	33	109	79
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	398	0	0	256	0	0	0	0	0	196	0
Confl. Peds. (#/hr)	335		243	243		335	141		122	122		141
Confl. Bikes (#/hr)			11			4			2			2
Heavy Vehicles (%)	6%	12%	3%	0%	30%	0%	0%	0%	0%	0%	0%	6%
Turn Type										Perm		
Protected Phases		4			8						6	
Permitted Phases										6		
Actuated Green, G (s)		43.0			43.0						25.0	
Effective Green, g (s)		45.0			45.0						27.0	
Actuated g/C Ratio		0.56			0.56						0.34	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		770			767						512	
v/s Ratio Prot		c0.29			0.19							
v/s Ratio Perm											0.13	
v/c Ratio		0.52			0.33						0.38	
Uniform Delay, d1		10.8			9.4						20.2	
Progression Factor		0.74			1.00						0.94	
Incremental Delay, d2		2.3			1.2						2.0	
Delay (s)		10.3			10.6						20.9	
Level of Service		B			B						C	
Approach Delay (s)		10.3			10.6			0.0			20.9	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	219	64	152	216	7	46	128	125	19	279	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.7	3.0	3.0	4.6	3.0
Grade (%)		-2%			0%			2%			-5%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.87		1.00	0.98		1.00	0.83			0.90	
Flpb, ped/bikes	0.59	1.00		0.73	1.00		1.00	1.00			0.99	
Frt	1.00	0.97		1.00	0.99		1.00	0.92			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	996	1338		1207	1400		1503	1443			1811	
Flt Permitted	0.59	1.00		0.50	1.00		0.30	1.00			0.96	
Satd. Flow (perm)	618	1338		631	1400		467	1443			1740	
Peak-hour factor, PHF	0.60	0.80	0.77	0.79	0.90	0.75	0.84	0.89	0.76	0.55	0.88	0.80
Adj. Flow (vph)	53	274	83	192	240	9	55	144	164	35	317	139
RTOR Reduction (vph)	0	16	0	0	2	0	0	58	0	0	20	0
Lane Group Flow (vph)	53	342	0	192	247	0	55	250	0	0	471	0
Confl. Peds. (#/hr)	282		199	199		282	87		144	144		87
Confl. Bikes (#/hr)			8			4			3			3
Heavy Vehicles (%)	0%	15%	3%	2%	24%	0%	11%	1%	1%	0%	1%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	37.0		37.0	37.0		21.0	21.0			21.0	
Effective Green, g (s)	39.0	39.0		39.0	39.0		23.0	23.0			23.0	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.33	0.33			0.33	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	344	745		352	780		153	474			572	
v/s Ratio Prot		0.26			0.18			0.17				
v/s Ratio Perm	0.09			c0.30			0.12				c0.27	
v/c Ratio	0.15	0.46		0.55	0.32		0.36	0.53			0.82	
Uniform Delay, d1	7.5	9.2		9.9	8.3		17.9	19.1			21.6	
Progression Factor	1.00	1.00		1.00	1.00		0.97	0.98			1.00	
Incremental Delay, d2	1.0	2.0		6.0	1.1		6.3	4.1			12.6	
Delay (s)	8.5	11.2		15.8	9.4		23.7	22.8			34.3	
Level of Service	A	B		B	A		C	C			C	
Approach Delay (s)		10.9			12.2			22.9			34.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	9	6	19	13	29	15	236	30	107	234	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			3%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.99			0.84			0.94			0.95	
Flpb, ped/bikes		0.83			0.98			0.99			0.93	
Frt		0.98			0.94			0.99			0.98	
Flt Protected		0.97			0.98			1.00			0.99	
Satd. Flow (prot)		1455			1428			1733			1583	
Flt Permitted		0.85			0.92			0.97			0.83	
Satd. Flow (perm)		1281			1341			1691			1333	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	10	7	21	14	32	16	257	33	116	254	61
RTOR Reduction (vph)	0	5	0	0	22	0	0	6	0	0	9	0
Lane Group Flow (vph)	0	37	0	0	45	0	0	300	0	0	422	0
Confl. Peds. (#/hr)	83		17	17		83	85		165	165		85
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0			38.0			38.0	
Effective Green, g (s)		22.0			22.0			40.0			40.0	
Actuated g/C Ratio		0.31			0.31			0.57			0.57	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		403			421			966			762	
v/s Ratio Prot												
v/s Ratio Perm		0.03			c0.03			0.18			c0.32	
v/c Ratio		0.09			0.11			0.31			0.55	
Uniform Delay, d1		16.9			17.0			7.8			9.4	
Progression Factor		1.00			1.00			0.95			0.87	
Incremental Delay, d2		0.5			0.5			0.8			2.1	
Delay (s)		17.4			17.5			8.2			10.3	
Level of Service		B			B			A			B	
Approach Delay (s)		17.4			17.5			8.2			10.3	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	848	170	131	425	0	0
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Peak Hour Factor	0.97	0.97	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	874	175	149	483	0	0
Pedestrians	2			8	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			1	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.70		0.73	0.70
vC, conflicting volume			1084		1538	1005
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			910		1270	797
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			72		100	100
cM capacity (veh/h)			524		83	230

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	1049	310	322
Volume Left	0	149	0
Volume Right	175	0	0
cSH	1700	524	1700
Volume to Capacity	0.62	0.28	0.19
Queue Length 95th (m)	0.0	8.8	0.0
Control Delay (s)	0.0	9.4	0.0
Lane LOS		A	
Approach Delay (s)	0.0	4.6	
Approach LOS			

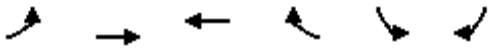
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	34	99	425	0	0	488
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	108	462	0	0	530
Pedestrians	72		134			85
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	6		11			7
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			142			142
pX, platoon unblocked	0.92	0.87			0.87	
vC, conflicting volume	1198	619			534	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	862	490			393	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	75			100	
cM capacity (veh/h)	249	439			954	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	37	108	462	530
Volume Left	37	0	0	0
Volume Right	0	108	0	0
cSH	249	439	1700	954
Volume to Capacity	0.15	0.25	0.27	0.00
Queue Length 95th (m)	3.9	7.2	0.0	0.0
Control Delay (s)	21.9	15.8	0.0	0.0
Lane LOS	C	C		
Approach Delay (s)	17.4		0.0	0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	363	234	5	20	26
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	395	254	5	22	28
Pedestrians		1	3		80	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		7	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		87	239			
pX, platoon unblocked						
vC, conflicting volume	340				754	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	340				754	338
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	96
cM capacity (veh/h)	1136				347	655

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	404	260	50
Volume Left	10	0	22
Volume Right	0	5	28
cSH	1136	1700	473
Volume to Capacity	0.01	0.15	0.11
Queue Length 95th (m)	0.2	0.0	2.7
Control Delay (s)	0.3	0.0	13.5
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	13.5
Approach LOS			B

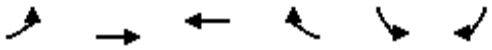
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	46	17	129	16	17	408
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)	50	18	140	17	18	443
Pedestrians	21		24			25
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	2		2			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			61			237
pX, platoon unblocked						
vC, conflicting volume	674	195			179	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	674	195			179	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	98			99	
cM capacity (veh/h)	398	813			1372	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	158	462
Volume Left	50	0	18
Volume Right	18	17	0
cSH	462	1700	1372
Volume to Capacity	0.15	0.09	0.01
Queue Length 95th (m)	3.9	0.0	0.3
Control Delay (s)	14.1	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	14.1	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	113	212	209	31	61	150
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Peak Hour Factor	0.85	0.78	0.90	0.88	1.00	0.93
Hourly flow rate (vph)	133	272	232	35	61	161
Pedestrians		37	65		330	
Lane Width (m)		3.0	3.0		4.2	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		3	5		32	
Right turn flare (veh)						3
Median type		None	None			
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	597				1165	599
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	597				1165	599
tC, single (s)	4.1				*6.2	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				49	51
cM capacity (veh/h)	655				118	330

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	133	272	232	35	222
Volume Left	133	0	0	0	61
Volume Right	0	0	0	35	161
cSH	655	1700	1700	1700	432
Volume to Capacity	0.20	0.16	0.14	0.02	0.51
Queue Length 95th (m)	5.7	0.0	0.0	0.0	21.8
Control Delay (s)	11.9	0.0	0.0	0.0	36.3
Lane LOS	B				E
Approach Delay (s)	3.9		0.0		36.3
Approach LOS					E

Intersection Summary			
Average Delay	10.8		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

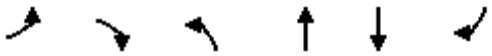
* User Entered Value



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	349	50	36	231	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	379	54	39	251	0	0
Pedestrians	300					
Lane Width (m)	3.0					
Walking Speed (m/s)	1.2					
Percent Blockage	21					
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.91		0.93	0.91
vC, conflicting volume			434		1036	407
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			326		889	296
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1120		223	675

Direction, Lane #	EB 1	WB 1
Volume Total	434	290
Volume Left	0	39
Volume Right	54	0
cSH	1700	1120
Volume to Capacity	0.26	0.03
Queue Length 95th (m)	0.0	0.8
Control Delay (s)	0.0	1.4
Lane LOS		A
Approach Delay (s)	0.0	1.4
Approach LOS		

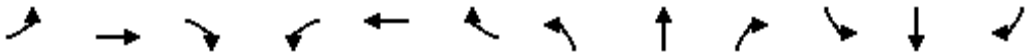
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	8	0	78	142	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	9	0	85	154	23
Pedestrians	24					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	275	190	201			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	275	190	201			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	700	835	1343			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	85	177
Volume Left	10	0	0
Volume Right	9	0	23
cSH	758	1343	1700
Volume to Capacity	0.02	0.00	0.10
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	9.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.9	0.0	0.0
Approach LOS	A		

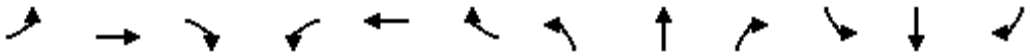
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	8	59	0	16	0	18	35	29	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			4%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	9	64	0	17	0	20	38	32	30
Pedestrians		75			31			31			28	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			3			3			2	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					162							
pX, platoon unblocked												
vC, conflicting volume	92			31			234	141	62	160	141	167
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	92			31			234	141	62	160	141	167
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	100	98	95	96	96
cM capacity (veh/h)	1466			1540			584	709	950	718	709	801

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	73	37	100
Volume Left	0	9	17	38
Volume Right	0	0	20	30
cSH	1700	1540	734	738
Volume to Capacity	0.00	0.01	0.05	0.14
Queue Length 95th (m)	0.0	0.1	1.2	3.6
Control Delay (s)	0.0	0.9	10.2	10.6
Lane LOS		A	B	B
Approach Delay (s)	0.0	0.9	10.2	10.6
Approach LOS			B	B

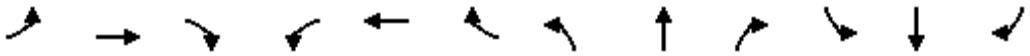
Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	42	10	6	55	45	7	22	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			2%			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)	16	46	11	7	60	49	8	24	3	0	0	0
Pedestrians		49			35			41			9	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			3			4			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					81							
pX, platoon unblocked												
vC, conflicting volume	118			98			271	255	127	240	236	142
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	118			98			271	255	127	240	236	142
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	96	100	100	100	100
cM capacity (veh/h)	1459			1443			602	611	864	635	626	861

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	73	115	35	0
Volume Left	16	7	8	0
Volume Right	11	49	3	0
cSH	1459	1443	626	1700
Volume to Capacity	0.01	0.00	0.06	0.00
Queue Length 95th (m)	0.3	0.1	1.3	0.0
Control Delay (s)	1.7	0.5	11.1	0.0
Lane LOS	A	A	B	A
Approach Delay (s)	1.7	0.5	11.1	0.0
Approach LOS			B	A

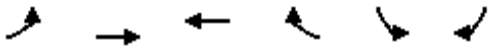
Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	30.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	4	89	0	6	0	0	0	55	31
Sign Control		Free			Free			Stop			Stop	
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)	0	0	0	4	97	0	7	0	0	0	60	34
Pedestrians		90			18			48			50	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		8			2			4			4	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					237							
pX, platoon unblocked												
vC, conflicting volume	147			48			307	203	66	173	203	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	147			48			307	203	66	173	203	237
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	91	95
cM capacity (veh/h)	1374			1495			472	634	942	696	634	709

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	101	7	93
Volume Left	0	4	7	0
Volume Right	0	0	0	34
cSH	1700	1495	472	659
Volume to Capacity	0.00	0.00	0.01	0.14
Queue Length 95th (m)	0.0	0.1	0.3	3.7
Control Delay (s)	0.0	0.3	12.7	11.4
Lane LOS		A	B	B
Approach Delay (s)	0.0	0.3	12.7	11.4
Approach LOS			B	B

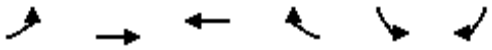
Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	28	376	225	8	7	11
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	409	245	9	8	12
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		166	161			
pX, platoon unblocked						
vC, conflicting volume	284				809	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284				809	393
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	98
cM capacity (veh/h)	1244				315	577

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	439	253	20
Volume Left	30	0	8
Volume Right	0	9	12
cSH	1244	1700	436
Volume to Capacity	0.02	0.15	0.04
Queue Length 95th (m)	0.6	0.0	1.1
Control Delay (s)	0.8	0.0	13.6
Lane LOS	A		B
Approach Delay (s)	0.8	0.0	13.6
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		57.5%	ICU Level of Service B
Analysis Period (min)		15	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	352	253	7	21	13
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	383	275	8	23	14
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		247	80			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	332				842	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	290				818	424
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	97
cM capacity (veh/h)	1177				288	517

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	399	283	37
Volume Left	16	0	23
Volume Right	0	8	14
cSH	1177	1700	347
Volume to Capacity	0.01	0.17	0.11
Queue Length 95th (m)	0.3	0.0	2.7
Control Delay (s)	0.5	0.0	16.6
Lane LOS	A		C
Approach Delay (s)	0.5	0.0	16.6
Approach LOS			C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	34	203
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	37	221
Pedestrians	20					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked						
vC, conflicting volume	315	20			20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315	20			20	
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	100			98	
cM capacity (veh/h)	663	1058			1596	

Direction, Lane #	SB 1
Volume Total	258
Volume Left	37
Volume Right	0
cSH	1596
Volume to Capacity	0.02
Queue Length 95th (m)	0.5
Control Delay (s)	1.2
Lane LOS	A
Approach Delay (s)	1.2
Approach LOS	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

63: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	2.6	0.0	0.6	0.2	3.4
Delay / Veh (s)	24.9	0.5	12.5	18.6	17.0
Stop Delay (hr)	2.4	0.0	0.5	0.2	3.1
St Del/Veh (s)	22.8	0.1	11.1	17.7	15.5
Total Stops	138	1	76	21	236
Travel Dist (km)	47.3	14.4	14.8	2.2	78.7
Travel Time (hr)	3.9	0.4	1.0	0.2	5.5
Avg Speed (kph)	15	40	14	9	17
Fuel Used (l)	86.8	16.8	26.5	4.4	134.5
HC Emissions (g)	3	1	1	0	5
CO Emissions (g)	987	269	423	28	1708
NOx Emissions (g)	9	2	4	0	16
Vehicles Entered	382	141	162	32	717
Vehicles Exited	382	141	162	32	717
Hourly Exit Rate	382	141	162	32	717
Input Volume	405	150	181	32	768
% of Volume	94	94	90	100	93
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

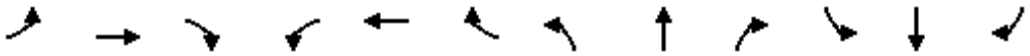
91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	All
Total Delay (hr)	0.1	0.2	0.3	0.7
Delay / Veh (s)	1.6	2.1	19.0	3.5
Stop Delay (hr)	0.1	0.1	0.3	0.5
St Del/Veh (s)	0.9	0.8	16.9	2.4
Total Stops	25	11	66	102
Travel Dist (km)	23.3	22.7	8.8	54.9
Travel Time (hr)	0.8	0.9	0.6	2.3
Avg Speed (kph)	29	26	16	24
Fuel Used (l)	41.5	33.6	13.0	88.1
HC Emissions (g)	5	5	1	11
CO Emissions (g)	1155	1077	256	2488
NOx Emissions (g)	14	14	3	31
Vehicles Entered	305	319	66	690
Vehicles Exited	305	318	66	689
Hourly Exit Rate	305	318	66	689
Input Volume	295	378	69	742
% of Volume	103	84	96	93
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

Scenario D 2020 PM with modifications

HCM Signalized Intersection Capacity Analysis
28: Sackville St & Brunswick Street

3/29/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	496	316	36	17	121	76	58	349	34	85	185	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.1	3.7	3.7	4.2	3.7	3.7	3.6	3.7	3.0	3.7	3.7
Grade (%)		-7%			10%			2%			-3%	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.95			0.91		1.00	0.98		1.00	0.91	
Flpb, ped/bikes	1.00	1.00			0.96		1.00	1.00		0.95	1.00	
Frt	1.00	0.98			0.96		1.00	0.98		1.00	0.89	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1709	1709			1572		1771	1782		1572	1559	
Flt Permitted	0.33	1.00			0.88		0.12	1.00		0.31	1.00	
Satd. Flow (perm)	585	1709			1399		219	1782		514	1559	
Peak-hour factor, PHF	0.94	0.87	0.73	0.44	0.89	0.89	0.78	0.82	0.70	0.86	0.90	0.79
Adj. Flow (vph)	528	363	49	39	136	85	74	426	49	99	206	575
RTOR Reduction (vph)	0	6	0	0	22	0	0	5	0	0	125	0
Lane Group Flow (vph)	528	406	0	0	238	0	74	470	0	99	656	0
Confl. Peds. (#/hr)	87		157	157		87	85		71	71		85
Confl. Bikes (#/hr)			5			2			3			13
Heavy Vehicles (%)	2%	1%	0%	0%	4%	0%	2%	1%	11%	3%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.0	36.0			16.0		32.0	32.0		32.0	32.0	
Effective Green, g (s)	36.0	38.0			18.0		34.0	34.0		34.0	34.0	
Actuated g/C Ratio	0.45	0.48			0.22		0.42	0.42		0.42	0.42	
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	488	812			315		93	757		218	663	
v/s Ratio Prot	c0.22	0.24						0.26			c0.42	
v/s Ratio Perm	c0.27				0.17		0.34			0.19		
v/c Ratio	1.08	0.50			0.76		0.80	0.62		0.45	0.99	
Uniform Delay, d1	19.5	14.5			29.0		20.0	18.0		16.4	22.8	
Progression Factor	0.90	0.90			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	53.6	1.1			15.5		49.1	3.8		6.7	32.4	
Delay (s)	71.1	14.1			44.5		69.1	21.8		23.1	55.2	
Level of Service	E	B			D		E	C		C	E	
Approach Delay (s)		46.2			44.5			28.1			51.6	
Approach LOS		D			D			C			D	

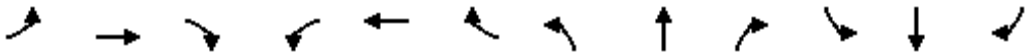
Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	688	133	81	587	249	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	4%			-4%	4%	
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			0.95	1.00	1.00
Frpb, ped/bikes	0.95			1.00	1.00	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	1723			3637	1771	1485
Flt Permitted	1.00			0.61	0.95	1.00
Satd. Flow (perm)	1723			2231	1771	1485
Peak-hour factor, PHF	0.87	0.92	0.87	0.87	0.92	0.93
Adj. Flow (vph)	791	145	93	675	271	417
RTOR Reduction (vph)	8	0	0	0	0	100
Lane Group Flow (vph)	928	0	0	768	271	317
Confl. Peds. (#/hr)		75	75		9	3
Confl. Bikes (#/hr)		14				9
Heavy Vehicles (%)	1%	2%	0%	2%	1%	3%
Turn Type			Perm			Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Actuated Green, G (s)	46.0			46.0	20.0	20.0
Effective Green, g (s)	49.0			49.0	23.0	23.0
Actuated g/C Ratio	0.61			0.61	0.29	0.29
Clearance Time (s)	7.0			7.0	7.0	7.0
Lane Grp Cap (vph)	1055			1366	509	427
v/s Ratio Prot	c0.54				0.15	
v/s Ratio Perm				0.34		c0.21
v/c Ratio	0.88			0.56	0.53	0.74
Uniform Delay, d1	13.0			9.2	24.0	25.8
Progression Factor	0.96			1.34	1.00	1.00
Incremental Delay, d2	9.8			0.6	4.0	11.0
Delay (s)	22.3			12.9	27.9	36.8
Level of Service	C			B	C	D
Approach Delay (s)	22.3			12.9	33.3	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

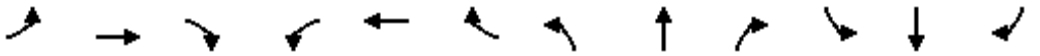
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	209	58	45	332	186	84	243	48	43	143	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.6	3.7	3.7	3.7	3.7	3.7	4.6	3.7	3.0	4.8	3.7
Grade (%)		3%			7%			-3%			3%	
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	
Frpb, ped/bikes		0.94			1.00	0.59		0.94			0.81	
Flpb, ped/bikes		0.95			1.00	1.00		1.00			1.00	
Frt		0.98			1.00	0.85		0.98			0.96	
Flt Protected		0.98			0.99	1.00		0.99			0.99	
Satd. Flow (prot)		1751			1803	907		1913			1603	
Flt Permitted		0.59			0.85	1.00		0.74			0.82	
Satd. Flow (perm)		1050			1549	907		1428			1326	
Peak-hour factor, PHF	0.81	0.76	0.79	0.65	0.96	0.83	0.70	0.85	0.90	0.67	0.84	0.85
Adj. Flow (vph)	217	275	73	69	346	224	120	286	53	64	170	115
RTOR Reduction (vph)	0	6	0	0	0	58	0	5	0	0	20	0
Lane Group Flow (vph)	0	559	0	0	415	166	0	454	0	0	329	0
Confl. Peds. (#/hr)	80		97	97		80	154		135	135		154
Confl. Bikes (#/hr)			6			2			2			1
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		48.0			48.0	48.0		30.0			30.0	
Effective Green, g (s)		50.0			50.0	50.0		32.0			32.0	
Actuated g/C Ratio		0.56			0.56	0.56		0.36			0.36	
Clearance Time (s)		6.0			6.0	6.0		6.0			6.0	
Lane Grp Cap (vph)		583			861	504		508			471	
v/s Ratio Prot												
v/s Ratio Perm		c0.53			0.27	0.18		c0.32			0.25	
v/c Ratio		0.96			0.48	0.33		0.89			0.70	
Uniform Delay, d1		19.0			12.1	10.9		27.4			24.9	
Progression Factor		1.00			1.00	1.00		1.00			0.98	
Incremental Delay, d2		28.5			1.9	1.7		20.7			7.1	
Delay (s)		47.5			14.1	12.6		48.1			31.5	
Level of Service		D			B	B		D			C	
Approach Delay (s)		47.5			13.6			48.1			31.5	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

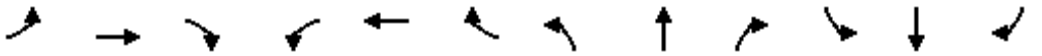
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	193	56	96	217	417	53	613	173	275	273	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	4.8	3.7	3.7	3.2	3.7	3.7	3.7	3.7	3.0	3.3	3.7
Grade (%)		2%			-1%			2%			-2%	
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.97			1.00	0.93		1.00	0.85	1.00	1.00	
Flpb, ped/bikes		1.00			0.98	1.00		1.00	1.00	1.00	1.00	
Frt		0.97			1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.98	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1963			1732	1498		1855	1355	1668	1799	
Flt Permitted		0.98			0.69	1.00		0.95	1.00	0.11	1.00	
Satd. Flow (perm)		1920			1216	1498		1770	1355	190	1799	
Peak-hour factor, PHF	0.93	0.93	0.93	0.99	0.99	0.99	0.96	0.96	0.96	0.98	0.98	0.98
Adj. Flow (vph)	13	208	60	97	219	421	55	639	180	281	279	16
RTOR Reduction (vph)	0	12	0	0	0	229	0	0	99	0	3	0
Lane Group Flow (vph)	0	269	0	0	316	192	0	694	81	281	292	0
Confl. Peds. (#/hr)	18		48	48		18	11		61	61		11
Confl. Bikes (#/hr)			2			4			8			8
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		20.0			20.0	20.0		33.0	33.0	46.0	46.0	
Effective Green, g (s)		23.0			23.0	23.0		36.0	36.0	46.0	49.0	
Actuated g/C Ratio		0.29			0.29	0.29		0.45	0.45	0.57	0.61	
Clearance Time (s)		7.0			7.0	7.0		7.0	7.0	4.0	7.0	
Lane Grp Cap (vph)		552			350	431		797	610	276	1102	
v/s Ratio Prot										c0.11	0.16	
v/s Ratio Perm		0.14			c0.26	0.13		0.39	0.06	c0.47		
v/c Ratio		0.49			0.90	0.44		0.87	0.13	1.02	0.27	
Uniform Delay, d1		23.6			27.4	23.3		19.9	12.9	21.8	7.2	
Progression Factor		1.00			0.74	0.75		0.79	1.15	1.00	1.00	
Incremental Delay, d2		3.1			25.9	2.9		7.8	0.3	58.9	0.6	
Delay (s)		26.7			46.4	20.2		23.6	15.1	80.7	7.8	
Level of Service		C			D	C		C	B	F	A	
Approach Delay (s)		26.7			31.4			21.9			43.3	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

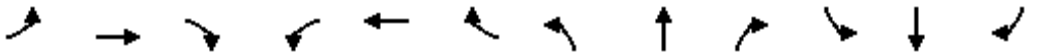
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	257	97	87	439	75	124	478	167	64	235	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			3%			-1%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		0.95			0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	0.82		0.92			1.00	0.84
Flpb, ped/bikes	0.93	1.00		0.93	1.00	1.00		0.98			0.98	1.00
Frt	1.00	0.95		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.99	1.00
Satd. Flow (prot)	1705	1710		1680	1892	1316		3050			3424	1386
Flt Permitted	0.31	1.00		0.30	1.00	1.00		0.77			0.60	1.00
Satd. Flow (perm)	558	1710		538	1892	1316		2382			2071	1386
Peak-hour factor, PHF	0.77	0.81	0.68	0.85	0.97	0.79	0.73	0.91	0.74	0.60	0.89	0.85
Adj. Flow (vph)	112	317	143	102	453	95	170	525	226	107	264	60
RTOR Reduction (vph)	0	20	0	0	0	45	0	40	0	0	0	30
Lane Group Flow (vph)	112	440	0	102	453	50	0	882	0	0	371	30
Confl. Peds. (#/hr)	161		163	163		161	187		228	228		187
Confl. Bikes (#/hr)			12			13			6			5
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	4%	0%	0%	5%	0%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.0	30.0		30.0	30.0	30.0		38.0			38.0	38.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		40.0			40.0	40.0
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40		0.50			0.50	0.50
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lane Grp Cap (vph)	223	684		215	757	526		1191			1036	693
v/s Ratio Prot		c0.26			0.24							
v/s Ratio Perm	0.20			0.19		0.04		c0.37			0.18	0.02
v/c Ratio	0.50	0.64		0.47	0.60	0.10		0.74			0.36	0.04
Uniform Delay, d1	18.0	19.4		17.8	18.9	15.0		15.9			12.2	10.2
Progression Factor	1.01	1.01		1.00	1.00	1.00		0.88			0.93	0.91
Incremental Delay, d2	7.8	4.6		7.3	3.5	0.4		3.7			0.9	0.1
Delay (s)	26.0	24.2		25.1	22.4	15.3		17.6			12.3	9.4
Level of Service	C	C		C	C	B		B			B	A
Approach Delay (s)		24.5			21.8			17.6			11.9	
Approach LOS		C			C			B			B	

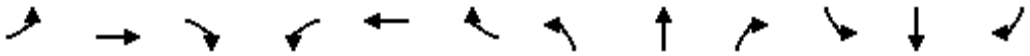
Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



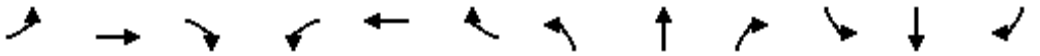
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	244	61	31	230	127	121	612	107	104	279	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.9	2.9	3.2	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.0	3.0
Grade (%)		0%			0%			2%			-2%	
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.25		1.00	0.46	1.00	0.87		1.00	1.00	0.56
Flpb, ped/bikes	0.83	1.00	1.00		0.96	1.00	0.77	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1344	1448	354		1532	684	1332	1546		1723	1739	855
Flt Permitted	0.36	1.00	1.00		0.93	1.00	0.53	1.00		0.19	1.00	1.00
Satd. Flow (perm)	514	1448	354		1439	684	748	1546		353	1739	855
Peak-hour factor, PHF	0.93	0.89	0.84	0.78	0.75	0.85	0.83	0.95	0.80	0.78	0.90	0.83
Adj. Flow (vph)	84	274	73	40	307	149	146	644	134	133	310	84
RTOR Reduction (vph)	0	0	49	0	0	21	0	4	0	0	0	0
Lane Group Flow (vph)	84	274	24	0	347	128	146	774	0	133	310	84
Confl. Peds. (#/hr)	748		384	384		748	362		404	404		362
Confl. Bikes (#/hr)			3			9			9			16
Heavy Vehicles (%)	3%	21%	10%	14%	10%	1%	4%	2%	14%	7%	3%	0%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	23.0	23.0	23.0		23.0	23.0	43.0	43.0		43.0	43.0	43.0
Effective Green, g (s)	26.0	26.0	26.0		26.0	26.0	46.0	46.0		46.0	46.0	46.0
Actuated g/C Ratio	0.32	0.32	0.32		0.32	0.32	0.57	0.57		0.57	0.57	0.57
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Lane Grp Cap (vph)	167	471	115		468	222	430	889		203	1000	492
v/s Ratio Prot		0.19						c0.50			0.18	
v/s Ratio Perm	0.16		0.07		c0.24	0.19	0.20			0.38		0.10
v/c Ratio	0.50	0.58	0.21		0.74	0.58	0.34	0.87		0.66	0.31	0.17
Uniform Delay, d1	21.8	22.5	19.5		24.0	22.4	9.0	14.5		11.6	8.8	8.0
Progression Factor	0.98	0.94	1.24		0.81	0.74	1.14	1.22		0.82	0.75	0.73
Incremental Delay, d2	9.5	4.7	3.7		9.6	9.9	2.0	10.9		14.6	0.8	0.7
Delay (s)	30.8	25.7	28.0		28.9	26.5	12.3	28.5		24.1	7.4	6.6
Level of Service	C	C	C		C	C	B	C		C	A	A
Approach Delay (s)		27.1			28.2			26.0			11.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



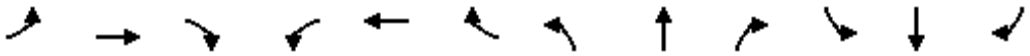
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	302	71	0	377	0	0	0	0	12	76	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.8	3.0	3.0	4.8	3.0
Grade (%)		0%			0%			4%			-4%	
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frpb, ped/bikes		0.77			1.00						0.75	
Flpb, ped/bikes		1.00			1.00						0.91	
Frt		0.97			1.00						0.95	
Flt Protected		1.00			1.00						0.99	
Satd. Flow (prot)		1140			1598						1374	
Flt Permitted		1.00			1.00						0.99	
Satd. Flow (perm)		1140			1598						1374	
Peak-hour factor, PHF	0.80	0.90	0.62	0.56	0.88	0.69	0.78	0.96	0.53	0.39	0.68	0.80
Adj. Flow (vph)	0	336	115	0	428	0	0	0	0	31	112	92
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	436	0	0	428	0	0	0	0	0	226	0
Confl. Peds. (#/hr)	691		566	566		691	252		296	296		252
Confl. Bikes (#/hr)			7			6			3			
Heavy Vehicles (%)	0%	20%	3%	6%	11%	0%	4%	0%	6%	9%	2%	3%
Turn Type										Perm		
Protected Phases		4			8						6	
Permitted Phases										6		
Actuated Green, G (s)		44.0			44.0						24.0	
Effective Green, g (s)		46.0			46.0						26.0	
Actuated g/C Ratio		0.57			0.57						0.32	
Clearance Time (s)		6.0			6.0						6.0	
Lane Grp Cap (vph)		656			919						447	
v/s Ratio Prot		c0.38			0.27							
v/s Ratio Perm											0.16	
v/c Ratio		0.66			0.47						0.51	
Uniform Delay, d1		11.7			9.9						21.8	
Progression Factor		1.02			1.00						0.96	
Incremental Delay, d2		3.9			1.7						4.0	
Delay (s)		15.8			11.6						24.8	
Level of Service		B			B						C	
Approach Delay (s)		15.8			11.6			0.0			24.8	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	286	62	172	267	26	167	382	237	9	226	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.7	3.0	3.0	3.0	3.0	3.7	3.0	3.7	3.0	3.7	3.7	3.7
Grade (%)		-2%			0%			2%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.82		1.00	0.93		1.00	0.83			0.80	
Flpb, ped/bikes	0.70	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.94			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1272	1212		1685	1466		1635	1470			1440	
Flt Permitted	0.45	1.00		0.39	1.00		0.47	1.00			0.98	
Satd. Flow (perm)	597	1212		700	1466		816	1470			1414	
Peak-hour factor, PHF	0.92	0.94	0.73	0.70	0.86	0.92	0.72	0.92	0.93	0.92	0.92	0.92
Adj. Flow (vph)	60	304	85	246	310	28	232	415	255	10	246	109
RTOR Reduction (vph)	0	11	0	0	3	0	0	14	0	0	12	0
Lane Group Flow (vph)	60	378	0	246	335	0	232	656	0	0	353	0
Confl. Peds. (#/hr)	435		420	420		435	271		340	340		271
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	22%	0%	0%	12%	2%	2%	2%	0%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.0	37.0		37.0	37.0		41.0	41.0			41.0	
Effective Green, g (s)	39.0	39.0		39.0	39.0		43.0	43.0			43.0	
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.48	0.48			0.48	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Lane Grp Cap (vph)	259	525		303	635		390	702			676	
v/s Ratio Prot		0.31			0.23			c0.45				
v/s Ratio Perm	0.10			c0.35			0.28				0.25	
v/c Ratio	0.23	0.72		0.81	0.53		0.59	0.94			0.52	
Uniform Delay, d1	16.1	21.0		22.3	18.7		17.1	22.2			16.4	
Progression Factor	1.00	1.00		1.00	1.00		0.84	0.80			1.00	
Incremental Delay, d2	2.1	8.2		20.6	3.1		5.4	18.6			2.9	
Delay (s)	18.1	29.2		42.9	21.8		19.9	36.4			19.2	
Level of Service	B	C		D	C		B	D			B	
Approach Delay (s)		27.8			30.7			32.1			19.2	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	47	0	40	74	175	54	484	87	134	196	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			3%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.76			0.92			0.87	
Flpb, ped/bikes		1.00			0.99			0.99			1.00	
Frt		1.00			0.92			0.98			0.96	
Flt Protected		0.98			0.99			1.00			0.99	
Satd. Flow (prot)		1845			1285			1676			1526	
Flt Permitted		0.79			0.95			0.92			0.67	
Satd. Flow (perm)		1481			1228			1556			1038	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	51	0	43	80	190	59	526	95	146	213	137
RTOR Reduction (vph)	0	0	0	0	62	0	0	7	0	0	15	0
Lane Group Flow (vph)	0	87	0	0	251	0	0	673	0	0	481	0
Confl. Peds. (#/hr)	78		19	19		78	94		157	157		94
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		25.0			25.0			53.0			53.0	
Effective Green, g (s)		27.0			27.0			55.0			55.0	
Actuated g/C Ratio		0.30			0.30			0.61			0.61	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		444			368			951			634	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.20			0.43			c0.46	
v/c Ratio		0.20			0.68			0.71			0.76	
Uniform Delay, d1		23.4			27.7			12.0			12.7	
Progression Factor		1.00			1.00			0.84			1.57	
Incremental Delay, d2		1.0			9.9			2.8			6.1	
Delay (s)		24.4			37.6			12.9			26.0	
Level of Service		C			D			B			C	
Approach Delay (s)		24.4			37.6			12.9			26.0	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	516	65	92	598	0	0
Sign Control	Free			Free	Stop	
Grade	4%			-4%	6%	
Peak Hour Factor	0.88	0.73	0.59	0.86	0.88	0.80
Hourly flow rate (vph)	586	89	156	695	0	0
Pedestrians	3			3	35	
Lane Width (m)	3.7			3.7	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	158			34		
pX, platoon unblocked			0.87		0.92	0.87
vC, conflicting volume			710		1328	669
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			595		937	547
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		100	100
cM capacity (veh/h)			853		197	418

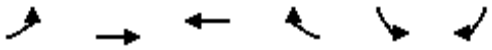
Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	675	388	464
Volume Left	0	156	0
Volume Right	89	0	0
cSH	1700	853	1700
Volume to Capacity	0.40	0.18	0.27
Queue Length 95th (m)	0.0	5.1	0.0
Control Delay (s)	0.0	5.4	0.0
Lane LOS		A	
Approach Delay (s)	0.0	2.4	
Approach LOS			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	13	162	0	43	0	36	38	38	63
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			4%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	176	0	47	0	39	41	41	68
Pedestrians		45			51			36			74	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			6	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					160							
pX, platoon unblocked												
vC, conflicting volume	250			36			374	314	87	368	314	295
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	250			36			374	314	87	368	314	295
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			89	100	96	91	92	90
cM capacity (veh/h)	1232			1526			424	540	900	465	541	670

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	190	86	151
Volume Left	0	14	47	41
Volume Right	0	0	39	68
cSH	1700	1526	558	565
Volume to Capacity	0.00	0.01	0.15	0.27
Queue Length 95th (m)	0.0	0.2	4.1	8.2
Control Delay (s)	0.0	0.6	12.6	13.7
Lane LOS		A	B	B
Approach Delay (s)	0.0	0.6	12.6	13.7
Approach LOS			B	B

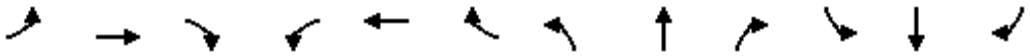
Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	32.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	358	502	8	26	65
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	389	546	9	28	71
Pedestrians			3		84	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		7	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		87	239			
pX, platoon unblocked	0.96				0.96	0.96
vC, conflicting volume	638				1065	634
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	605				1049	601
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				87	84
cM capacity (veh/h)	869				220	447

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	409	554	99
Volume Left	20	0	28
Volume Right	0	9	71
cSH	869	1700	345
Volume to Capacity	0.02	0.33	0.29
Queue Length 95th (m)	0.5	0.0	8.8
Control Delay (s)	0.7	0.0	19.6
Lane LOS	A		C
Approach Delay (s)	0.7	0.0	19.6
Approach LOS			C

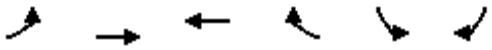
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	51	54	7	12	163	79	17	37	20	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			2%			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)	55	59	8	13	177	86	18	40	22	0	0	0
Pedestrians		75			59			48			68	
Lane Width (m)		3.7			3.7			3.7			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		6			5			4			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					81							
pX, platoon unblocked												
vC, conflicting volume	331			114			543	578	170	588	539	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	331			114			543	578	170	588	539	363
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			95	90	97	100	100	100
cM capacity (veh/h)	1228			1414			376	387	796	332	407	638

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	122	276	80
Volume Left	55	13	18
Volume Right	8	86	22
cSH	1228	1414	446
Volume to Capacity	0.05	0.01	0.18
Queue Length 95th (m)	1.1	0.2	5.0
Control Delay (s)	3.9	0.4	14.9
Lane LOS	A	A	B
Approach Delay (s)	3.9	0.4	14.9
Approach LOS			B

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	46.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	201	354	361	165	30	129
Sign Control		Free	Free		Stop	
Grade		-1%	6%		-4%	
Peak Hour Factor	0.94	0.91	0.85	0.96	0.92	0.92
Hourly flow rate (vph)	214	389	425	172	33	140
Pedestrians		16	33		435	
Lane Width (m)		3.0	3.0		3.0	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		1	2		30	
Right turn flare (veh)						3
Median type		None	None			
Median storage veh)						
Upstream signal (m)		90	193			
pX, platoon unblocked						
vC, conflicting volume	1032				1709	876
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1032				1709	876
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	54				12	41
cM capacity (veh/h)	462				37	239

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	214	389	425	172	173
Volume Left	214	0	0	0	33
Volume Right	0	0	0	172	140
cSH	462	1700	1700	1700	197
Volume to Capacity	0.46	0.23	0.25	0.10	0.88
Queue Length 95th (m)	18.2	0.0	0.0	0.0	50.8
Control Delay (s)	19.3	0.0	0.0	0.0	83.4
Lane LOS	C				F
Approach Delay (s)	6.9		0.0		83.4
Approach LOS					F

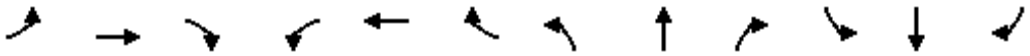
Intersection Summary			
Average Delay	13.5		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	425	82	61	365	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	462	89	66	397	0	0
Pedestrians	591			3	630	
Lane Width (m)	3.0			3.0	0.0	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	41			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	88			78		
pX, platoon unblocked			0.86		0.93	0.86
vC, conflicting volume			1181		2257	1140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1129		1994	1080
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		100	100
cM capacity (veh/h)			531		32	227

Direction, Lane #	EB 1	WB 1
Volume Total	551	463
Volume Left	0	66
Volume Right	89	0
cSH	1700	531
Volume to Capacity	0.32	0.12
Queue Length 95th (m)	0.0	3.2
Control Delay (s)	0.0	3.6
Lane LOS		A
Approach Delay (s)	0.0	3.6
Approach LOS		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	16	249	0	52	0	0	0	55	80
Sign Control		Free			Free			Stop			Stop	
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)	0	0	0	17	271	0	57	0	0	0	60	87
Pedestrians		28			32			60			84	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		2			3			5			7	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					237							
pX, platoon unblocked												
vC, conflicting volume	355			60			510	449	92	421	449	383
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	355			60			510	449	92	421	449	383
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			81	100	100	100	86	86
cM capacity (veh/h)	1117			1464			303	439	891	441	439	602

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	288	57	147
Volume Left	0	17	57	0
Volume Right	0	0	0	87
cSH	1700	1464	303	523
Volume to Capacity	0.00	0.01	0.19	0.28
Queue Length 95th (m)	0.0	0.3	5.1	8.7
Control Delay (s)	0.0	0.6	19.6	14.5
Lane LOS		A	C	B
Approach Delay (s)	0.0	0.6	19.6	14.5
Approach LOS			C	B

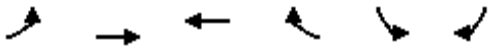
Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	60	377	536	0	0	284
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	410	583	0	0	309
Pedestrians	52		163			169
Lane Width (m)	3.0		3.7			3.7
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	4		14			14
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			141			143
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	1106	804			635	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	994	659			454	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	0			100	
cM capacity (veh/h)	189	319			891	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	65	410	583	309
Volume Left	65	0	0	0
Volume Right	0	410	0	0
cSH	189	319	1700	891
Volume to Capacity	0.34	1.28	0.34	0.00
Queue Length 95th (m)	11.0	146.8	0.0	0.0
Control Delay (s)	33.7	183.5	0.0	0.0
Lane LOS	D	F		
Approach Delay (s)	162.9		0.0	0.0
Approach LOS	F			

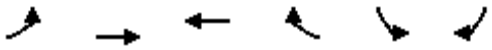
Intersection Summary			
Average Delay	56.6		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	51	409	491	8	23	12
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	445	534	9	25	13
Pedestrians		113	60		31	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		10	5		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		168	159			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	573				1184	682
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	494				1158	612
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				86	97
cM capacity (veh/h)	959				174	399

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	500	542	38
Volume Left	55	0	25
Volume Right	0	9	13
cSH	959	1700	216
Volume to Capacity	0.06	0.32	0.18
Queue Length 95th (m)	1.4	0.0	4.8
Control Delay (s)	1.6	0.0	25.2
Lane LOS	A		D
Approach Delay (s)	1.6	0.0	25.2
Approach LOS			D

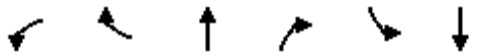
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	55	344	495	16	52	19
Sign Control		Free	Free		Stop	
Grade		3%	3%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	374	538	17	57	21
Pedestrians		133	99		49	
Lane Width (m)		3.7	3.7		3.7	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		11	8		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		247	79			
pX, platoon unblocked	0.89				0.89	0.89
vC, conflicting volume	604				1188	729
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	490				1149	631
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				65	94
cM capacity (veh/h)	912				160	362

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	434	555	77
Volume Left	60	0	57
Volume Right	0	17	21
cSH	912	1700	188
Volume to Capacity	0.07	0.33	0.41
Queue Length 95th (m)	1.6	0.0	14.0
Control Delay (s)	1.9	0.0	36.9
Lane LOS	A		E
Approach Delay (s)	1.9	0.0	36.9
Approach LOS			E

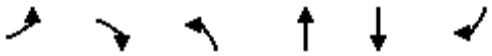
Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	141	233
Sign Control	Stop		Free			Free
Grade	0%		6%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	153	253
Pedestrians	102					
Lane Width (m)	0.0					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			127			
pX, platoon unblocked						
vC, conflicting volume	662	102			102	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	662	102			102	
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	100			90	
cM capacity (veh/h)	383	953			1490	

Direction, Lane #	SB 1
Volume Total	407
Volume Left	153
Volume Right	0
cSH	1490
Volume to Capacity	0.10
Queue Length 95th (m)	2.6
Control Delay (s)	3.5
Lane LOS	A
Approach Delay (s)	3.5
Approach LOS	

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	85	19	4	290	140	64
Sign Control	Stop			Free	Free	
Grade	0%			0%	-4%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	21	4	315	152	70
Pedestrians	141					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	12					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					187	
pX, platoon unblocked						
vC, conflicting volume	652	328	363			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652	328	363			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	97	100			
cM capacity (veh/h)	379	627	1051			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	113	320	222
Volume Left	92	4	0
Volume Right	21	0	70
cSH	408	1051	1700
Volume to Capacity	0.28	0.00	0.13
Queue Length 95th (m)	8.5	0.1	0.0
Control Delay (s)	17.2	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	17.2	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	28	362	84	38	304
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)	33	30	393	91	41	330
Pedestrians			75			81
Lane Width (m)			3.7			3.7
Walking Speed (m/s)			1.2			1.2
Percent Blockage			6			7
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			58			237
pX, platoon unblocked	1.00	1.00			1.00	
vC, conflicting volume	927	520			485	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	927	520			484	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	94			96	
cM capacity (veh/h)	268	518			1078	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	63	485	372
Volume Left	33	0	41
Volume Right	30	91	0
cSH	349	1700	1078
Volume to Capacity	0.18	0.29	0.04
Queue Length 95th (m)	4.9	0.0	0.9
Control Delay (s)	17.6	0.0	1.3
Lane LOS	C		A
Approach Delay (s)	17.6	0.0	1.3
Approach LOS	C		

Intersection Summary			
Average Delay		1.7	
Intersection Capacity Utilization		65.1%	ICU Level of Service C
Analysis Period (min)		15	

174: Queen Street & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	NE	All
Total Delay (hr)	0.2	0.2	3.1	0.8	4.2
Delay / Veh (s)	1.6	1.6	52.3	21.2	14.8
Stop Delay (hr)	0.1	0.0	3.0	0.8	3.9
St Del/Veh (s)	0.8	0.2	50.8	20.6	13.6
Total Stops	20	13	213	113	359
Travel Dist (km)	41.2	35.7	24.7	8.7	110.4
Travel Time (hr)	1.2	0.9	3.9	1.1	7.1
Avg Speed (kph)	35	38	6	8	16
Fuel Used (l)	60.8	33.6	53.3	17.4	165.1
HC Emissions (g)	2	1	1	0	5
CO Emissions (g)	928	393	370	132	1823
NOx Emissions (g)	8	4	4	2	18
Vehicles Entered	334	345	217	133	1029
Vehicles Exited	335	345	214	132	1026
Hourly Exit Rate	335	345	214	132	1026
Input Volume	340	397	231	138	1106
% of Volume	99	87	93	96	93
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

91: Spring Garden Road & Birmingham Street Performance by approach Entire Run

Approach	EB	WB	NB	All
Total Delay (hr)	2.2	0.4	3.6	6.2
Delay / Veh (s)	23.1	2.7	74.0	22.2
Stop Delay (hr)	2.0	0.1	3.5	5.6
St Del/Veh (s)	20.5	0.7	72.0	20.0
Total Stops	191	35	196	422
Travel Dist (km)	26.3	36.5	23.5	86.3
Travel Time (hr)	3.0	1.4	4.3	8.7
Avg Speed (kph)	9	26	6	10
Fuel Used (l)	53.1	54.6	57.4	165.0
HC Emissions (g)	8	4	1	13
CO Emissions (g)	1456	1067	350	2872
NOx Emissions (g)	19	13	3	36
Vehicles Entered	350	483	177	1010
Vehicles Exited	347	484	176	1007
Hourly Exit Rate	347	484	176	1007
Input Volume	351	534	172	1057
% of Volume	99	91	102	95
Denied Entry Before	0	0	0	0
Denied Entry After	1	0	0	1

Appendix D

Meeting Minutes

AECOM
302 – 1150 Morrison Drive
Ottawa, ON, Canada K2H 8S9
www.aecom.com

613 820 8282 tel
613 820 8338 fax

Minutes of Meeting

Date of Meeting	December 14, 2009	Start Time 2:00 PM	Project Number
Project Name	Spring Garden Road Area Transportation Study		
Location	1701 Hollis Street		
Regarding	Project initiation		
Attendees	Ray Rice (AECOM), Roddy MacIntyre (HRM), Vanessa Skelton (AECOM), Peter Bigelow (HRM), Barry Yanchyshyn (HRM)		
Distribution	attendees		

PLEASE NOTE: If this report does not agree with your records of the meeting, or if there are any omissions, please advise, otherwise we will assume the contents to be correct.

Item		Assigned
1.0	**INTRODUCTION**	
	An introduction was provided by all meeting attendees. Other members of the Steering committee not available for this meeting were Alan Taylor a Transportation Planner from Traffic and Right of Way Services and _____ from the Real Estate division.	
2.0	**SCHEDULE**	
	Due to the later than anticipated start to the project, the schedule has been changed from that which was originally submitted as part of the proposal. A tentative revised schedule was prepared and was circulated at the meeting. Traffic counts originally scheduled for the very start of the study have been scheduled for the first and second week of January in order to avoid skewed traffic counts during the Christmas season. There are other projects for HRM that are driving the timelines for this transportation study. The library construction project will be presented to council in late January and will include a financial plan. The library will be partially financed through the sale of municipally owned parking lots in the area. The architects for this project are expected to be hired at the beginning of February and will be looking for results from our report. The real estate division of HRM will also require the results of the study in order to release the parcels of land to the market. The	

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	proposed March deadline for this study matches the needs of the real estate division. The project schedule as presented will be adopted as the updated schedule.	
3.0	**TRAFFIC DATA COLLECTION PROGRAM**	
	It is anticipated that traffic counts will be undertaken in the first two weeks of January. The existing traffic model is a macroscopic view of the Halifax region. The traffic counts undertaken to populate the model were both manual counts and miovision counts and were collected midweek (Tuesday, Wednesday and Thursday). Our traffic data will be collected to match the same hours and days. Due to the fact that data will be collected in January which is typically not a high volume month, the turning percentages at each intersection will be the crucial piece of information. These turning percentages will be used to balance the volumes collected with the surrounding intersections already in the Synchro model.	
4.0	**IDENTIFICATION OF STAKEHOLDERS**	
	Stakeholders for this project will include: The Library Steering Committee, the management team from HRM including the Real Property Planning section for related projects, and the local business association who had submitted the proposal for a one-way street system. The transportation study report will be an internal document and will be released as required. The baseline scenario is an important component of the study as it will demonstrate how the current traffic patterns operate within the Spring Garden Road area.	
5.0	**DISCUSSION OF ISSUES**	
	The construction of the new library is expected to be a $55 million investment. The vacant land in the area, which is currently used as parking lots, will be sold to help finance the project. The type of development and size of development will depend partially on the results of the traffic study. It is anticipated that the new developments will contain enough parking to handle the demand from the buildings themselves as well as provide parking to replace the parking lots that will be removed. It may be possible that the parking demand will factor into the type of building to be constructed. Reports are available which discuss the potential uses for the lots to ensure the vitality of the district. It is the intention that the future	

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	development will expand the district and promote revitalization of the area. A main issue for this transportation study is whether additional vehicles generated by new developments can be accommodated on the existing road network. There are several stores within the area that attract many customers with vehicles. It is often difficult to find parking along Dresden Row. Along Spring Garden Road, there are many vehicles simply cruising which makes it very slow and congested. It is a very pedestrian oriented street and has many crosswalks. It is also a transit corridor. Other development known at this time consists of a tower of condos on the City Centre building and the Trillium project on the south side of Spring Garden Road which will contain high-end condos and commercial on the ground floor. Dalhousie is planning to consolidate the engineering departments on the nearby campus and possibly construct a residence. Richard Harvey should have information regarding the City Centre development. The planning department also has a growth study which should discuss growth projections for the area. There are a limited number of sites that are available for redevelopment. The maximum build out has been determined and is described in the report entitled "HRM by Design" which is available on the website. Background growth figures will be developed from growth projections in the area and will be collected from Richard Harvey. Also, historic traffic volumes for various pertinent road sections will be provided in order to assist in the development of background growth projections. There are three blocks of protected heritage area between Clyde Street and Morris Street. Merchants are concerned about any loss of parking since there is a general sense that most of their clients use cars. Due to a lack of driveways, parking for residents is mainly on the street. Many of the on-street parking spaces are restricted to 1-2 hours. Exemptions are provided in some cases for residents. All no parking zones must remain in any future road network. The proposed streetscape plan for Spring Garden Road contained 3 parking stalls. There is no expectation that the transportation study will increase or decrease parking. Some methods to direct drivers to available parking would be beneficial. The Collier study recommends different parking scenarios.	RM RM
6.0	**DISCUSSION OF METHODOLOGY**	
	The parking turnover rates used in the existing Synchro model will be	

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	used for the additional streets added to the model. The proposed one-way system will be modeled as proposed and then may be modified as required. A new traffic signal is included at Queen Street and Sackville Street as part of the one-way system. This signal will be investigated as part of the traffic model. All aspects of the methodology as submitted in the proposal are acceptable.	
7.0	**INFORMATION GATHERING**	
	Information was provided by HRM to Ray Rice at the meeting who will forward the material to Vanessa.	RR
8.0	**BILLING REQUIREMENTS**	
	A letter confirming Worker's compensation coverage and Insurance is required. These letters were included in the proposal so it will be verified if these conditions have been met with the information provided in the proposal.	RR and RM

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Minutes of Meeting

Date of Meeting	February 5, 2010	Start Time	1:00 PM	Project Number	60144708
Project Name	Spring Garden Road Area Transportation Study				
Location	1701 Hollis Street				
Regarding	Project initiation				
Attendees	Ray Rice (AECOM), Roddy MacIntyre (HRM), Vanessa Skelton (AECOM), Barry Yanchyshyn (HRM)				
Distribution	Attendees, Peter Bigelow (HRM)				

PLEASE NOTE: If this report does not agree with your records of the meeting, or if there are any omissions, please advise, otherwise we will assume the contents to be correct.

Item		Assigned
1.0	**DISCUSSION OF METHODOLOGY**	
	VS reviewed the traffic counting program and the input into the Synchro model. The network size was reduced but all other factors remained the same as in the existing model such as lane designation and heavy vehicle percentages. Once the existing situation was analysed, the traffic was redistributed as per the scenarios B-D. The volumes for each scenario were input into the model and results were tabulated.	
2.0	**PRESENTATION OF REDISTRIBUTION PATTERNS**	
	The distribution patterns were presented and reviewed for each scenario. One suggestion was made with regard to scenario C and the distribution of traffic originally northbound on Dresden. The assumption was made that traffic would reroute by turning left at Birmingham and heading north along Birmingham instead of Dresden. The suggestion was that traffic could head north on Dresden, turn right on Clyde and then left on Birmingham. This change will be added to the redistribution scenarios.	VS
3.0	**VOLUME IMPACTS**	
	The volumes distribution for each scenario was presented and particular attention was drawn to intersections where an increase in volume was observed. (Spring Garden/ Brunswick,	

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	Artillery/Birmingham/Queen, Queen/Morris and Queen/Sackville) These intersections may experience increased delay.	
4.0	**PRESENTATION OF INTERSECTION ANALYSIS**	
	Synchro analysis was used to determine the delays at the intersections. The delays are reported as per HCM (Highway Capacity Manual) calculations except for the intersection of Artillery/Queen/Birmingham where the unusual configuration could not be analysed using Synchro. For this intersection, the SimTraffic delay results were included in the analysis. The intersections in the Spring Garden area analysed using both the Synchro and SimTraffic modelling software. The results from both SimTraffic and Synchro were compared and the SimTraffic results seemed too optimistic therefore the Synchro results were used. The approaches with poor levels of service (E, F) were flagged but since a high delay for a low volume should not be equally compared to a high delay for a high volume, it was decided that vehicle-hours of delay would be used to compare the intersections for all scenarios. Each intersection was reviewed for changes in overall delay. Many intersections had relatively stable results however the intersections that had changes in delay were discussed in more detail. The concept of a roundabout at the intersection of Queen/Artillery/Birmingham was mentioned and this idea had been considered. VS had discussed a roundabout with Steve Sargeant, AECOM's roundabout specialist, and due to the geometry of the roadways it is not considered feasible. The space required is not available and the main flow of traffic along Queen Street would deviate from the existing continuous flow pattern. This concept will be discussed in the interim report. The many pedestrians in the area were mentioned as contributing factors to delay, especially at the intersection of Spring Garden and Brunswick. At the intersection of Dresden Row and Spring Garden, with the reduction in conflicting movements, the signals may be able to be removed. This will be considered as a possible modification. The intersection of Morris and Queen is approaching capacity and signals may need to be considered in the future. HRM monitors intersection volumes and has recently installed traffic signals at the	VS VS

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	intersection of Queen and South.	
5.0	**DISCUSSION OF IMPACTS**	
	The impacts related to access and the changes in geometry were discussed. The availability of on-street parking was discussed and it was mentioned that one of the reasons for testing the one-way scenario was to increase on-street parking. The Birmingham and Dresden parking lots would likely be equally used by patrons and the smaller lot on Birmingham has 82 spaces while the lot on Dresden has 109 spaces. The location for access points to the future underground parking was discussed. These locations are not currently known but will be important in assigning future traffic. Ross Cantwell from Colliers will be contacted to learn if any updated information is available regarding the layout of the Queen Street parcel of land.	BY
6.0	**SCHEDULE**	
	The project is mainly on schedule and there was some float time built into the schedule for the development of future traffic projections. This task is now underway and a conference call was held this week to discuss the available data. The growth study mentioned at the previous meeting seems to be non-existent. The project is on track for the completion of the interim report by February 19. This will allow Peter to provide information on this study at his meeting on February 23.	
7.0	**NEXT MEETING**	
	The next meeting was tentatively scheduled for Thursday, February 18.	

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Minutes of Meeting

Date of Meeting	February 22, 2010	Start Time	1:00 PM	Project Number	60144708
Project Name	Spring Garden Road Area Transportation Study				
Location	1701 Hollis Street				
Regarding	Project initiation				
Attendees	Ray Rice (AECOM), Roddy MacIntyre (HRM), Vanessa Skelton (AECOM), Barry Yanchyshyn (HRM), Peter Bigelow (HRM)				
Distribution	Attendees, Alan Taylor				

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Item		Assigned
1.0	**PRESENTATION OF INTERIM REPORT**	
	VS presented an overview of the report. In the final report, recommendations may be included regarding the optimal locations for vehicle access to the library and new developments. The cost of the traffic signals at Queen and Sackville could likely be somewhat higher than mentioned in the report. Other signals in HRM usually cost in the $200,000 to $250,000 range. Particular mention was made about the high pedestrian volumes along Spring Garden Road and in the area in general. These pedestrians have an impact on traffic flow as pedestrians crossing the road interrupt the free flow of vehicular traffic. There have been public misconceptions that the congestion along Spring Garden Road must be due to a high volume of vehicles as is the case in many instances in other locations. It was suggested that the section of the report dealing with the intersection level of service could be expanded to discuss in more details the intersections with the poor levels of service. Since this report may be released to the public, the language and wording may need to be adjusted for readers with little to no traffic engineering knowledge.	

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	An additional impact in Scenario C and D is the removal of existing parking on Brenton Place. Responses to the issues of the business community: • To investigate the one-way system • To maximize on-street parking • To change Doyle to a one-way street and • To change Brenton Place to a one-way street were provided in the report. As a result of the analyses, Scenario D was the recommended option. This scenario provides improved traffic flow and improves pedestrian movement. The narrowing of Spring Garden Road at Birmingham and at Dresden Row reduces the distance for pedestrians to cross and therefore increases safety.	
2.0	**PRESENTATION OF FUTURE TRAFFIC FORECASTS**	
	Presentation sheets were distributed at the meeting. Background growth figures were determined from population growth as presented in Census records and from the Colliers report. It was determined that the overall growth of the region would be the most appropriate growth rate to use. A blend of interim growth rates provides for a 0.9% annual growth rate. Specific attention was given to intersections which were already exhibiting a poor level of service since additional volumes will negatively affect intersections that are near or at capacity. For new developments, information was taken from the traffic impact studies for the Trillium development and the City Centre Atlantic development. The Trillium development is a high-end condo development and is likely to produce more vehicle trips. Other potential residential developments may not be as high end and therefore will not generate as many trips. This corresponds with the results of the Colliers report which stated that the new developments are not expected to provide as much parking as the Trillium development. There is expected to be high transit use for work trips to this downtown area. For the land use of Specialty Retail in the Spring Garden Area since this is a very pedestrian oriented area, low range rates have been used for PM peak hour trip generation rates. Also, there are no published rates for the AM peak hour for the Land Use, however it is expected that this area will have some traffic in the AM peak hour related to the Specialty Retail. AM trip rates have been assumed to be 50% of the	

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	PM rate with reversal of the directional split. Should the development traffic produce a negative impact on intersection operations in the area, a possible solution may be to advance the timeline of various transit projects.	
3.0	**SCHEDULE**	
	The project is on schedule to be completed by the end of March.	
4.0	**NEXT MEETING**	
	The next meeting is to be determined.	

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Minutes of Meeting

Date of Meeting	March 17, 2010	Start Time	3:00 PM	Project Number	60144708
Project Name	Spring Garden Road Area Transportation Study				
Location	1701 Hollis Street				
Regarding	Project initiation				
Attendees	Roddy MacIntyre (HRM), Peter Bigelow (HRM), Barry Yanchyshyn (HRM), Alan Taylor (HRM), Vanessa Skelton (AECOM),				
Distribution	Attendees, Ray Rice				

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Item		Assigned
1.0	**VOLUME IMPACTS**	
	Some discussion occurred regarding the optimization of signals in the base model scenario. The Synchro model data provided by HRM was not optimized for in the initial analysis but only in the proposed modification scenarios. The first step was to compare 2010 volume data for each scenario (A-D) and then suggest improvements to the scenarios, including signal timing optimization. In this way, each scenario has baseline results. Next, 2020 traffic volumes were calculated based on background growth of the region. The Scenario A volumes had been presented at the last project meeting and the volumes for Scenarios B-D were presented at this meeting. It was noted that although left turns are prohibited from southbound South Park Street onto Brenton Place, a few vehicles do make this turn. It was also mentioned that the number of vehicles redistributed due the prohibition of eastbound and westbound left turns at the intersection of Dresden Row and Spring Garden Road in Scenarios B and D was minimal. Development traffic was then added to the 2020 traffic volumes. This increased the total traffic mainly along Queen Street and Clyde Street. The traffic generated by the new developments was shown on a diagram. The Library and Site B traffic was the highest since the site represented 67500 square feet of retail, the library (108,000 square feet) and some residential. (138,400 square feet). The library is	

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	expected to have a high amount of traffic as many program will be offered through the library site.	
2.0	**PRESENTATION OF INTERSECTION ANALYSIS**	
	Charts were presented with the results of the intersection analysis for both the 2020 volume scenarios (background growth only and background growth + development traffic). It was indicated that the intersection of Artillery and Birmingham was analysed using SimTraffic rather than Synchro due to the unusual configuration of the intersection. Several other intersections had analysis issues using the Synchro software including Spring Garden at Brunswick and at Birmingham. The pedestrian volumes are very high at these intersections and the model is not able to handle high pedestrian volumes. Also, the volume to capacity ratios became too high to give a realistic delay calculation. For this reason an arbitrary delay of 400 seconds was used for these intersections, which were highlighted in yellow. In comparing the total vehicle hours of delay for the 2020 background growth scenario, Scenario D had the least delay, however, once development traffic was added to the study area, Scenario B had the least amount of delay.	
3.0	**DISCUSSION OF IMPACTS**	
	The development traffic impacts the intersections along Queen Street and the existing stop sign control at Morris and at Clyde causes large delays for vehicles. The installation of traffic signals may be considered at these intersections. There was also discussion regarding traffic signals at Spring Garden and Brunswick and whether traffic signals would improve the traffic flow at this intersection. This idea will be considered with the modifications to be investigated. A warrant analysis (6 hour analysis period) will be required prior to the installation of traffic signals at any intersection and since this study is only analysing the peak periods of traffic, comments from this study will be related to the likelihood of improved traffic operations during the peak hours of traffic flow. Another possible improvement to be considered at the intersection of Queen and Morris will be the installation of a roundabout. It is the intention that the sidewalks along Queen Street will be widened as part of the library construction project and hence the number of traffic lanes along Queen Street required for traffic operations and parking should be considered. The driveway to sites C and D were assumed to be located on Clyde Street and the driveway to sites A and B was assumed to be at the intersection of Queen and Clyde. This location permits the traffic flow	VS VS

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	in and out of the site to be controlled at the intersection. It will be important to construct a driveway long enough for the queue of vehicles entering the site to disperse before the queue backs up into the intersection. Conversely, the driveway should also be long enough to allow for proper sight distance at the approach to the intersection.	
4.0	**SCHEDULE**	
	The project is on schedule to have the final report (draft version) delivered by the end of March.	
5.0	**NEXT MEETING**	
	It was determined that a meeting to present the draft version of the final report will not be necessary.	