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# Dennis Building

Halifax, NS

Transportation Impact Study

December 2019

**Prepared for:**

DEXEL Developments  
1245 Barrington Street  
Halifax, NS  
B3J 1V2

**Prepared by:**

Roger N. Boychuk, P. Eng.  
Senior Transportation Engineer

Fathom Studio  
1 Starr Lane  
Dartmouth, Nova Scotia  
902 461 2525  
fathomstudio.ca

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# 01 Introduction and Existing Conditions



## 1.1 Context and Study Area

This study was prepared to identify the anticipated impacts of a new multi-unit residential building with ground floor commercial areas located in the southeast quadrant of the George Street / Barrington Street intersection and directly north of Parade Square. The lands currently house an asphalt surface parking lot with a single driveway access off Granville Street about 40 meters south of George Street. The property in this quadrant also houses the existing historic Dennis Building which will be maintained and incorporated into the new proposed development.

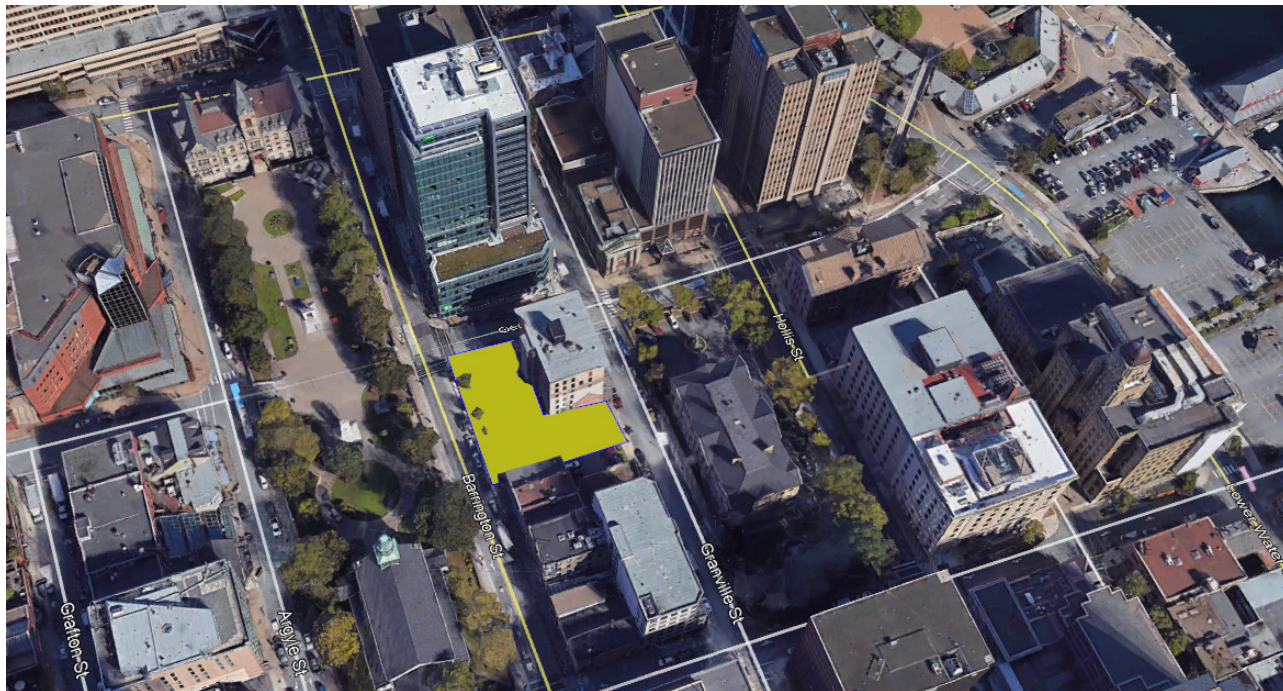
The site is bounded to the north by George Street (one-way eastbound), Granville Street to the east (one-way northbound) and Barrington Street to the west (two-way traffic). The development is located in the downtown core of Halifax adjacent to many low and high rise residential, office, commercial and institutional land uses. It has direct access to major multi-modal transportation infrastructure and is part of a high use active transportation environment / culture.

Initial access options to the new building included consideration of all adjacent streets including Barrington, George and Granville. Barrington Street is a high volume

commuter route and primary thoroughfare into and out of the downtown core of peninsular Halifax. The street has few driveway access points, high transit volumes and it was assumed that a new access to the Dennis Building would not be permitted from Barrington. Options from Granville Street are limited to the existing driveway location, though it is understood that there is strong opposition to a new residential driveway access directly across from Province House on Granville. The remaining option for driveway access is therefore from George Street. The proposed driveway would be located approximately 20 meters east of the Barrington Street curb line and immediately adjacent to the existing building.

The study was carried out using methodologies defined in HRM's Guidelines for the Preparation of Transportation Impact Studies, guidance provided by the Institute of Transportation Engineers (ITE), and general best practices for such studies. The study includes:

- A summary of existing conditions (traffic, transit, truck routes and active transportation);
- A definition of the proposed development and its associated anticipated traffic contributions to the transportation network;
- Modeling and analysis of the existing and future road network conditions; and,
- Discussion and recommendations addressing key operational, geometric and safety considerations that may be required to support the proposed development.





## 1.2 Existing Roads and Intersections



### George Street

George Street is a one-way eastbound street connecting Barrington Street to Lower Water Street. It is about 10 meters wide and just under 200 meters in length with an average downhill grade of about 6.5 percent towards the Harbour. It has a wide urban cross section complete with curb and gutter and concrete sidewalk on both sides of the road. Parking is permitted on both sides of the street at metered parking stalls though is limited to two spaces on the south side of the street and 4 spaces on the north side. The remaining roadway width is marked as a single shared lane, through there is approximately 6.1 meters of remaining width which is adequate space for the road to be used as two through lanes.



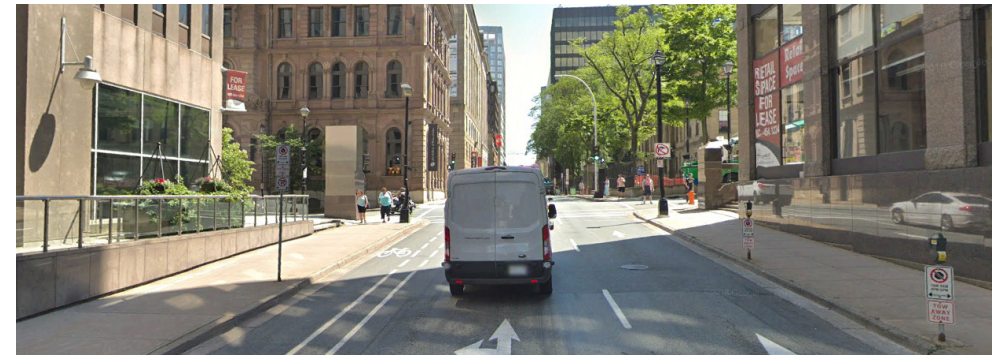
### Barrington Street

The portion of Barrington Street relevant to this study is a two-lane urban undivided arterial roadway extending from the current Cogswell interchange to the north and Inglis Street at its south end. It is primarily a commercial including a wide variety of commercial, retail, office, residential and other users. It has wide sidewalks along both sides of the road and high pedestrian volumes during most time of the day and evening. There is a major pedestrian crossing location on the south side of George Street connecting directly to Parade Square, therefore the area sees regular high volume event based vulnerable road user traffic in addition to the typical weekday and weekend active transportation traffic. Barrington is a well used commuter route into and out of the downtown core, has frequent bus and truck traffic, and often experiences impacts from loading vehicles.



### Granville Street

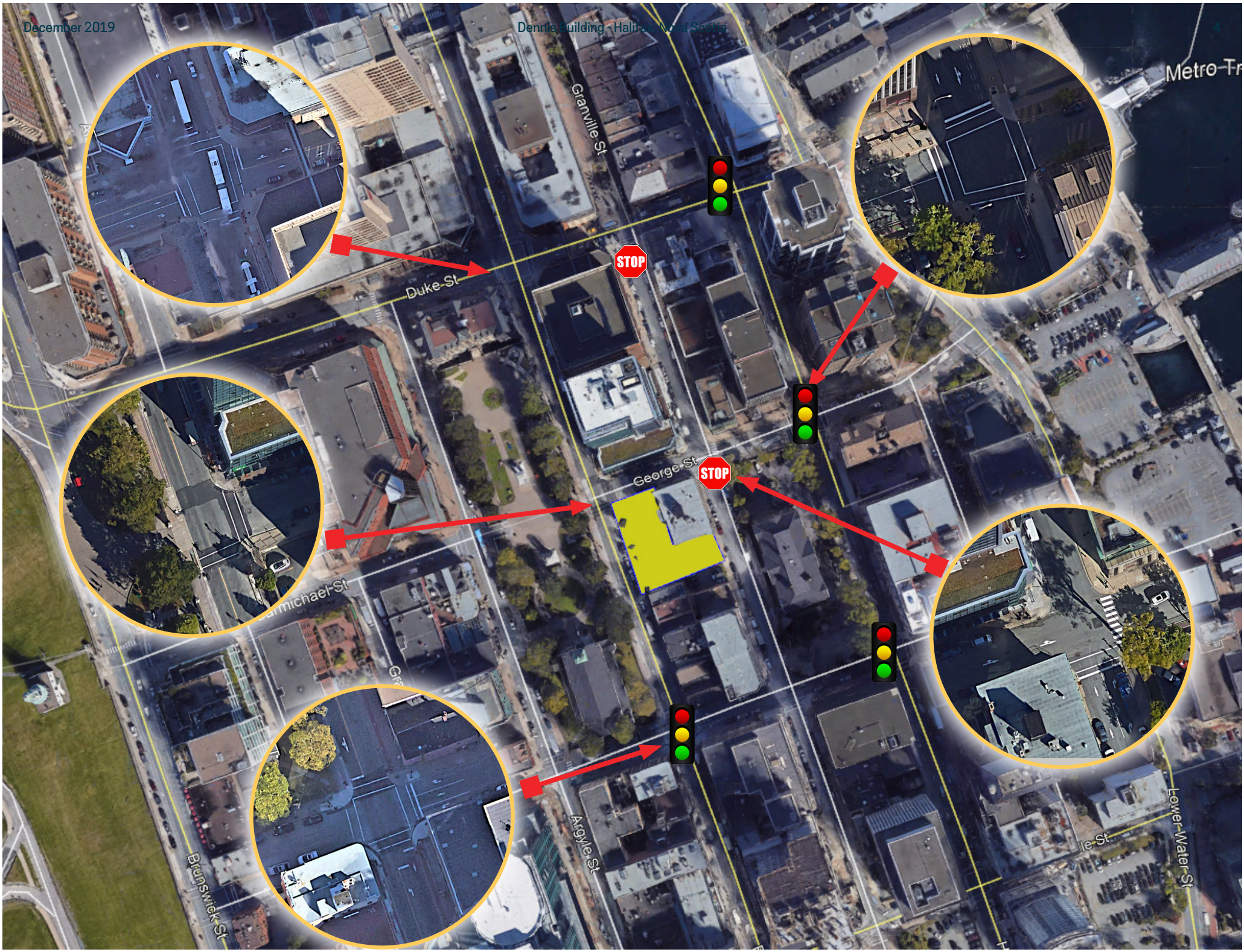
Granville is a one-way northbound urban collector roadway running between Salter Street and Duke Street through downtown Halifax parallel to the Harbour. It has an urban undivided cross section with sidewalk a wide sidewalk section placed directly on the back of curb. Parking is permitted on both sides of the road in most locations and also include loading zones and other curbside uses. As most other roads in the area, it primarily services adjacent commercial and institutional land uses resulting in reasonably high active transportation use during most times of the day and evening. Granville is typically stop controlled at the east-west crossing streets that traverse the peninsula at steep grades towards the Harbour.



### Hollis Street

Hollis Street is a major urban arterial roadway providing one-way inbound access to the downtown core of Halifax. It is coupled with Lower Water Street as a predominately one-way outbound street and form two of the primary commuter routes as well as serving as the primary truck routes through the downtown core including access to the Halterm Container Terminal. As a result, Hollis Street sees high truck volumes throughout the day. The roadway has wide sidewalks located directly on the back of curb and experiences high pedestrian volumes throughout the day. Hollis also includes a painted bike lane along its east side including a painted buffer strip for added separation between traffic and cyclists.





Granville St

Duke-St

STOP

George St

STOP

Brimley St

Brunswick St

Argyle St

le St

Lower Water St



# 1.3 Other Transportation Infrastructure

## Active Transportation

The core downtown areas of Halifax have documented high active transportation use including cyclists, pedestrians and other alternative modes of travel. This development is located in the heart of the this active transportation environment with many local AT origins and destinations surrounding the site.

The development is located within easy walking distance to multiple transit terminals, the Halifax Waterfront, commercial, office and institutional buildings, bars, restaurants, the Scotia Bank Center, Citadel Hill and more. The development has direct access to the dedicated bicycle and pedestrian walking facilities in the area and is immediately adjacent to Parade Square.

All routes and intersection crossings are already in place for this development and access points for the development naturally connect to existing sidewalk infrastructure along George Street, Barrington Street and Granville Street.

The abundance of active transportation infrastructure gives residents a wide variety of choices for making commuter or recreational based trips.

## Transit

The development is located in the heart of one of Halifax’s busiest transit areas which includes many routes on Duke Street and Barrington Street. It is in close proximity to the Scotia Square Terminal about 200 meters away as well as the Water Street Terminal and Dartmouth Ferry about 300 meters towards the Harbour.

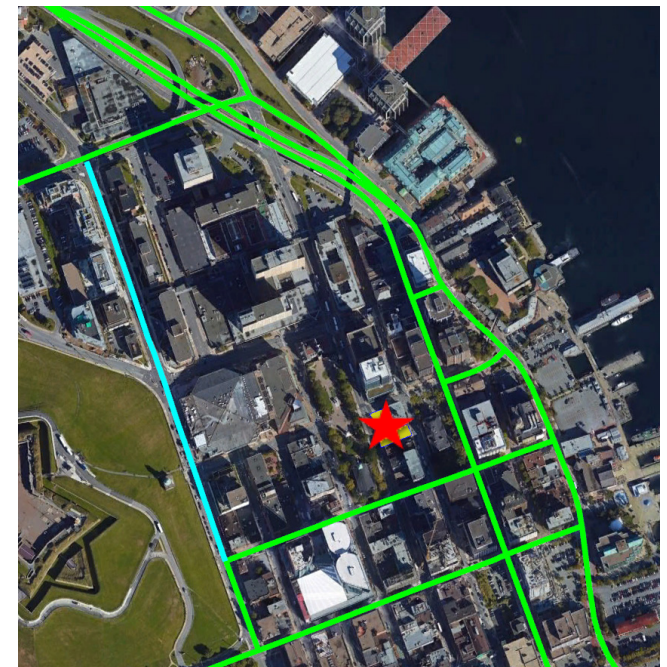
From these locations, residents of this development have quick and easy access directly to a wide variety of transit service routes literally outside their front door.



## Truck Routes

Halifax’s By-Law T-400 “Respecting the Establishment of Truck Routes for Certain Trucking Motor Vehicles within the HRM” defines Hollis Street and Barrington in the north-south directions “Full Time” truck routes identified in green in the figure below. In addition, Sackville, Prince as well as the lower portions of George Street and Duke Street as full time routes.

The portion of Brunswick Street between Prince Street and Cogswell Street are defined as daylight routes between the hours of 7 am and 9 pm. The red star identifies the location of the development near the middle of these routes which should allow for adequate access to the new development, though it is expected that delivery requirements will be minimal to this site.





# 02 Existing and Future Traffic Conditions

## 2.1 Existing Traffic

Existing traffic volumes were generated for the study area based on recent and historical intersection turning movement counts provided by Halifax as well as an additional 2019 turning movement count taken at the intersection of George and Barrington Street using the Miovision automated traffic counting platform. For counts performed in prior years, the counts were adjusted to a 2019 baseline scenario using an annual background traffic growth rate of 1%.

The Miovision counts included full multi-modal data including standard turning movement counts (TMC) as well as truck, pedestrian, and bicycle counts. Truck percentages, where available, were incorporated into the traffic modeling exercise for their respective intersections.

A summary of the count data used to generate our baseline traffic conditions as well as a baseline traffic count summary are provided in Appendix A of this report.

### Background Traffic Growth

Background traffic growth rates for traffic impact studies throughout HRM vary and are often in the 0.5 - 1% range, though actual growth is frequently less than this in many areas and even negative in some cases. Much of the natural traffic growth throughout the road network has been influenced by the regional planning initiatives implemented over the past decade. Some of this work has resulted in more development closer to the downtown cores of Halifax and Dartmouth. Simultaneously, it has promoted increased transit and active transportation use which in turn has helped limit traffic growth rates for personal vehicles.

To determine reasonable growth rates in past studies for the Dartmouth area, HRM was consulted regarding transportation modeling work that was carried out as part of the regional planning analysis, and those consultations recommended that an average annual growth rate of 0.5% was appropriate for this general project area. For the purposes of this study and in order to remain conservative, this study has assumed a 1% annual background traffic growth rate.

### Analysis Period

Roadways adjacent to the development are highly commuter oriented being on primary routes into and out of the downtown core of Halifax. While there are reasonably high volumes during weekend hours as well, there is a significantly higher concentration of peak traffic during the weekday commuter periods. Therefore, the weekday AM and PM peak hours are considered to be the critical periods for the analysis.



HALIFAX REGIONAL MUNICIPALITY  
TRANSPORTATION & PUBLIC WORKS  
TRAFFIC MANAGEMENT

CODE NO. 17-TM-393

### MANUAL TRAFFIC COUNTS

INTERSECTION: GEORGE STREET AT HOLLIS STREET WEATHER: CLOUDY

DAY: WED DATE: 6 MONTH: SEPT YEAR: 2017 RECORDER: KS

STREET TIME:	GEORGE STREET FROM THE EAST			GEORGE STREET FROM THE WEST			HOLLIS STREET FROM THE NORTH			HOLLIS STREET FROM THE SOUTH			TOTAL
	L	S	R	L	S	R	L	S	R	L	S	R	
07:00:00 AM	0	0	0	0	14	8	5	102	0	0	0	0	129
07:15:00 AM	0	0	0	0	12	9	4	103	0	0	0	0	128
07:30:00 AM	0	0	0	0	11	11	7	132	0	0	0	0	161
07:45:00 AM	0	0	0	0	24	7	8	185	0	0	0	0	224
TOTAL	0	0	0	0	61	35	24	522	0	0	0	0	642
PEAK	0	0	0	0	96	0	0	546	0	0	0	0	642
15 MIN PEAK	0	0	0	0	124	0	0	772	0	0	0	0	896
PEAK HOUR FACTOR	0	0	0	0	0.77	0	0	0.71	0	0	0	0	0.74
TWO WAY TOTALS	85	0	0	0	96	0	0	546	0	0	0	0	642

DAY: WED DATE: 6 MONTH: SEPT YEAR: 2017

TIME:	FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			TOTAL
	L	S	R	L	S	R	L	S	R	L	S	R	
08:00:00 AM	0	0	0	0	14	10	4	172	0	0	0	0	200
08:15:00 AM	0	0	0	0	18	13	4	216	0	0	0	0	251
08:30:00 AM	0	0	0	0	31	4	5	230	0	0	0	0	270
08:45:00 AM	0	0	0	0	17	5	3	180	0	0	0	0	205
TOTAL	0	0	0	0	80	32	16	798	0	0	0	0	926
PEAK	0	0	0	0	112	0	0	814	0	0	0	0	926
15 MIN PEAK	0	0	0	0	140	0	0	940	0	0	0	0	1080
PEAK HOUR FACTOR	0	0	0	0	0.8	0	0	0.87	0	0	0	0	0.82
TWO WAY TOTALS	96	0	0	0	112	0	0	814	0	0	0	0	926

10/03/17 12:52 PM Record

# 03 Proposed Development





## New Dennis Building Development

The proposed development is a mixed-use development at a corner street location bounded by George Street to the north, Barrington Street to the west and Granville Street to the east. The building ranges from 8-storays on the Barrington Street side to 9-storays along Granville Street, and navigates a substantial grade change of about 3 meters along George Street . The building includes approximately 120 units total (a mix of 1, 2 bedroom units, over 7000 ft<sup>2</sup> of at grade retail space, and 3 levels of concealed underground parking with a total of 110 parking stalls. Roof top amenity terraces provide a total of 100 m<sup>2</sup> common landscaped area. The proposed entrance to the building is off of George Street just east of Barrington Street and is discussed in greater detail in the conclusions and discussions section of the report.



# 3.1 Trip Generation, Distribution and Assignment

## Trips Generated by the Development

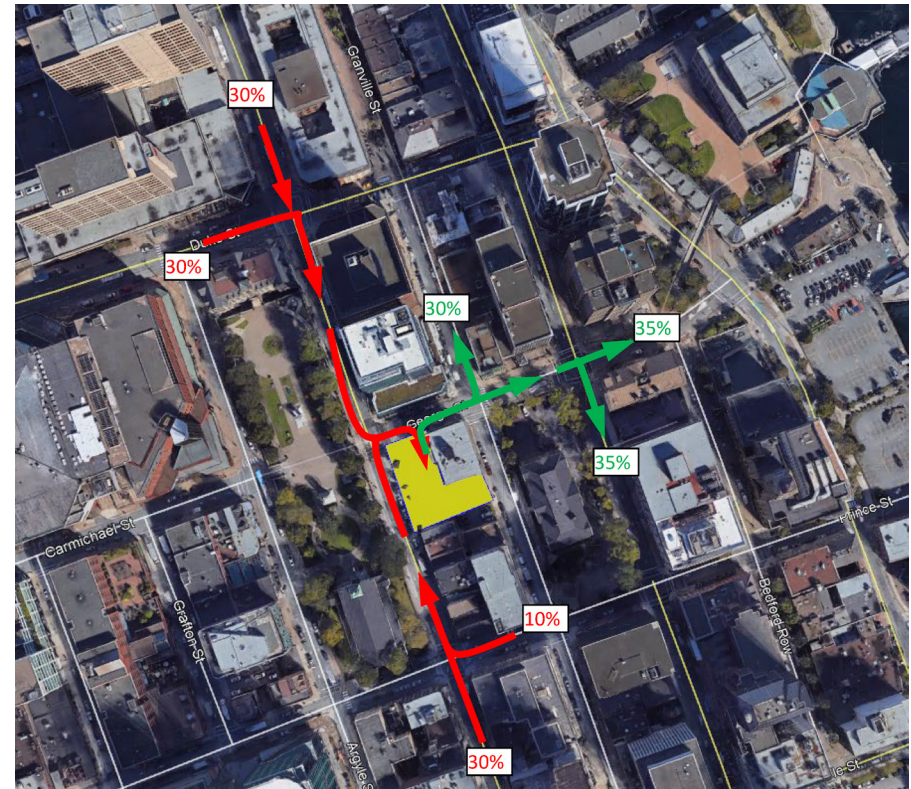
The new trips generated by the development were based on guidance provided from the Institute of Transportation Engineers (ITE) Trip Generation Guide (10th Edition). The table at the bottom of the page shows the estimated trips generated by the development based on an assumed 120-units of residential development and the inclusion of ground floor residential development.

## Transit and Active Transportation Impacts

There is expected to be a significant amount of active transportation activity generated by the site given the availability to the various active transportation and transit options surrounding the site. The 10th version of the ITE trip generation guide includes residential mid and high-rise buildings completed with ground floor commercial development. These revised land uses account for more reasonable levels of transit service from these types of developments. For the purposes of this analysis, the study has assumed no further trip generation reduction factors related to AT or transit availability, though it is likely that some may exist.

## Trip Distribution

Trips to and from the proposed site are expected to distribute themselves in a manner similar to today's traffic distribution. The trip distribution assumptions are shown in the figure to the right and are generally based on existing roadway volumes and logical route choices to and from the development site.



Land Use	Trip Code	# Units	Variable	AM Peak			PM Peak		
				Entering	Exiting	TOTAL	Entering	Exiting	TOTAL
<b>Phase 1, 2024 - 30% of Development</b>									
Mid Rise - Ground Floor Commercial	231	120	Units	10	26	36	30	13	43
<b>TOTAL DEVELOPMENT TRIPS</b>				<b>10</b>	<b>26</b>	<b>36</b>	<b>61</b>	<b>13</b>	<b>43</b>

## Trip Assignment

The new traffic volumes to and from the development were assigned to the road network based on the most logical accesses to the site given the above distribution. Given the one-way street network in the area, there are limited entry and exit options for the development. This includes the requirements for all exiting vehicles to turn right onto George Street exiting the building, and all vehicles entering the building to do so from Barrington Street onto George Street.

# 04 Transportation Analysis





## 4.1 Transportation Modeling

A detailed traffic model was prepared using the Synchro/SimTraffic (v.10) platform for the weekday AM and PM peak hours of analysis. The model was used to gain insight into operations and capacity utilization at the various intersections potentially impacted by the proposed development under each of the traffic loading scenarios.

The analysis included the following models for each of the AM and PM peak hours:

- **2019 Baseline** conditions;
- **2029** Future conditions with **background** traffic only; and,
- **2029** Future conditions with **background and full development** traffic.

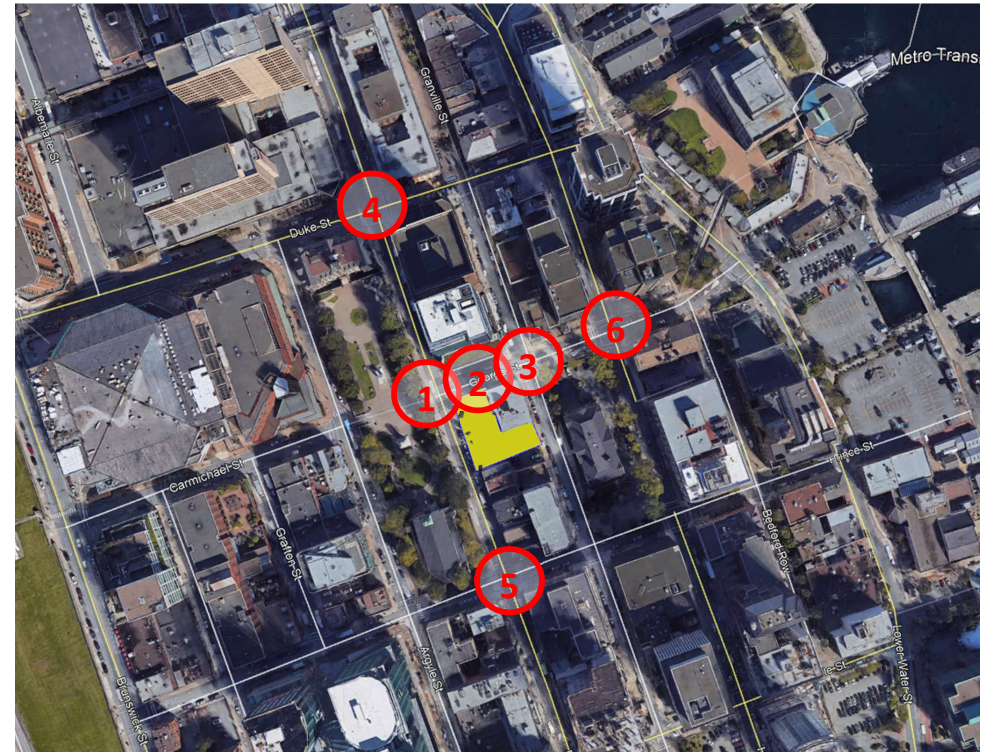
The model preparation utilized the Traffic Impact Analysis tool-set contained within the Synchro model to distribute development traffic throughout the study area and for the application of future growth of background traffic. The figure to the right identifies the main intersections reviewed in the analysis.

The downstream intersections along George Street see the biggest impact by exiting movements from the development and intersections on Barrington Street are the most significantly impacted by traffic entering the development. In general, volumes to and from this development are quite low and have minimal impacts on these intersections. Beyond these intersections, development related impacts are negligible.

The results of the modeling exercise are summarized by individual intersection for both the AM and PM peak hours. Results are shown in tabular form that allows for the quick comparison of key performance criteria between the different analysis scenarios. Key performance indicators include:

- Peak hour volumes (vehicles / hour);
- Volume to capacity ratios (V/C);
- Average Delay (sec/vehicle);
- Level of Service (A through F); and,
- 95% Queue lengths.

The summary tables are followed by a brief discussion of the results for each peak period at that intersection highlighting key findings. Additional details are provided in the Synchro reports provided in Appendix D of this report.



- 1 - George Street and Barrington Street
- 2 - George Street and New Dennis Driveway
- 3 - George Street and Granville Street
- 4 - Barrington Street and Duke Street
- 5 - Barrington Street and Prince Street
- 6 - George Street and Hollis Street

# 4.2 George Street and Barrington Street

## AM PEAK HOUR

George and Barrington		wBL		wBR		NBT		NBR		SBL		SBT	
2019 Baseline	Vol, veh/h					243	27	79	403				
	V/C Ratio					0.17		0.11					
	Control Delay (s/veh)					0		3					
	Lane LOS					-		A					
	95th %Queue (m)					0		3					
2024 Background	Vol, veh/h					255	28	83	424				
	V/C Ratio					0.18		0.12					
	Control Delay (s/veh)					0		3.1					
	Lane LOS					-		A					
	95th %Queue (m)					0		3.2					
2024 Development	Vol, veh/h					255	33	89	424				
	V/C Ratio					0.18		0.13					
	Control Delay (s/veh)					0		3.3					
	Lane LOS					-		A					
	95th %Queue (m)					0		3.5					

## PM PEAK HOUR

George and Barrington		wBL		wBR		NBT		NBR		SBL		SBT	
2019 Baseline	Vol, veh/h					376	21	61	331				
	V/C Ratio					0.25		0.1					
	Control Delay (s/veh)					0		2.9					
	Lane LOS					-		A					
	95th %Queue (m)					0		2.7					
2024 Background	Vol, veh/h					395	22	64	348				
	V/C Ratio					0.27		0.11					
	Control Delay (s/veh)					0		3.1					
	Lane LOS					-		A					
	95th %Queue (m)					0		3.1					
2024 Development	Vol, veh/h					395	36	85	348				
	V/C Ratio					0.28		0.15					
	Control Delay (s/veh)					0		4.1					
	Lane LOS					-		A					
	95th %Queue (m)					0		4.1					

From a traffic perspective, George Street and Barrington Street is a free flowing intersection with no stop control present as George is one-way street flowing in the eastbound direction. This means that George Street only **receives** traffic from Barrington from the southbound left and northbound right turn movements. As such, the measures of performance noted in the above table show a very high level of service at this intersection through all scenarios.

The most significant impacts at this intersection occur from two elements:

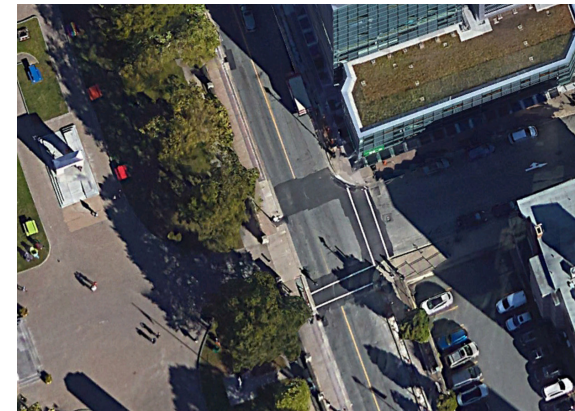
- High volumes of pedestrian traffic across the Barrington Street crosswalk which directly impacts northbound right turn onto George Street, as well as the George Street crosswalk which impacts both northbound right turns and southbound left turns;
- The single lane in the southbound direction meaning that any delays incurred by left turning vehicles onto George Street cause some delay to following southbound vehicles.

Despite the potential for some delay at this location, in general there is adequate gaps in the northbound traffic to allow left turns to be made with relatively low delays, though there is some potential for queues to occur due to various combinations of left turn vehicles, high pedestrian volumes, and bus service along George Street.

Operations during the PM peak are very similar to the AM peak. There is a slight shift in the direction distribution of traffic with more outbound traffic during the PM peak as opposed to higher inbound volumes during the PM peak. It is noted that during the PM peak, volumes in the north and southbound direction are similar in magnitude. That said, volumes are still low enough that adequate gaps can be found to keep the levels of performance at high levels.

The other phenomenon worth mentioning at this location is that vehicles general travel a slow speeds through this intersection due to a combination of narrow southbound lanes, high pedestrian volumes, the transitional nature of the area to the downtown, grades on George Street and frequent bus service.

Given the high volume of pedestrians, an environment that promotes slower vehicle speeds is considered a positive attribute of the intersection and approaching streets.



# 4.3 George Street and New Dennis Driveway

## AM PEAK HOUR

George and New Driveway		→		←		↔	
		EBT	EBR	wBL	wBT	NBL	NBR
2019 Baseline	Vol, veh/h	106	0				
	V/C Ratio	0.07					
	Control Delay (s/veh)	0					
	Lane LOS	A					
	95th %Queue (m)	0					
2024 Background	Vol, veh/h	111	0				
	V/C Ratio	0.07					
	Control Delay (s/veh)	0					
	Lane LOS	-					
	95th %Queue (m)	0					
2024 Development	Vol, veh/h	111	11				34
	V/C Ratio	0.08					0.04
	Control Delay (s/veh)	0					9.1
	Lane LOS	-					A
	95th %Queue (m)	0					1

## PM PEAK HOUR

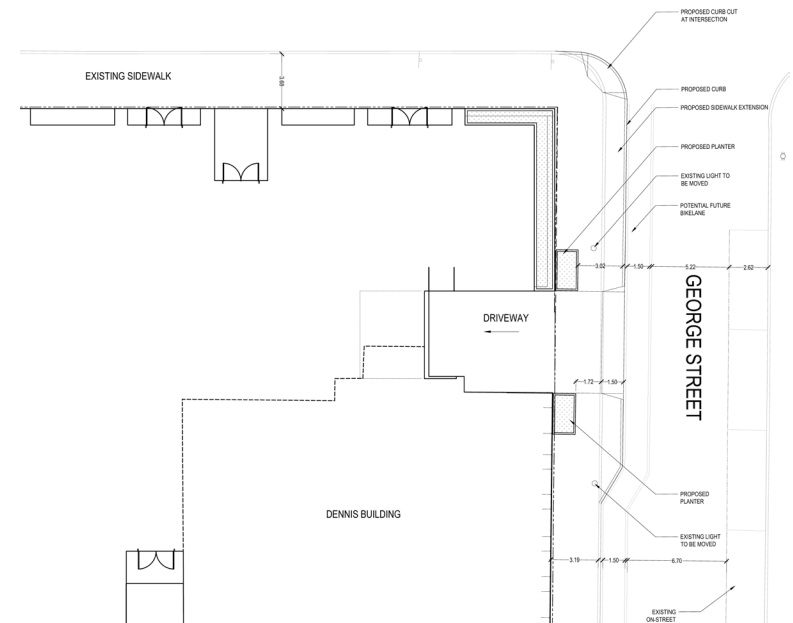
George and New Driveway		→		←		↔	
		EBT	EBR	wBL	wBT	NBL	NBR
2019 Baseline	Vol, veh/h	82	0				
	V/C Ratio	0.05					
	Control Delay (s/veh)	-					
	Lane LOS	A					
	95th %Queue (m)	0					
2024 Background	Vol, veh/h	86	0				
	V/C Ratio	0.05					
	Control Delay (s/veh)	-					
	Lane LOS	A					
	95th %Queue (m)	0					
2024 Development	Vol, veh/h	86	35				21
	V/C Ratio	0.08					0.02
	Control Delay (s/veh)	0					8.9
	Lane LOS	A					A
	95th %Queue (m)	0					0.6

There is no traffic to consider under the first two scenarios as no development in place hence no traffic from the driveway. In the third scenario, the table above shows the development traffic existing the new driveway and turning right onto George Street with very little delay. In general, this intersection operates with a very low capacity utilization of less than 10% in all scenarios.

Operationally, this intersection works very well under all anticipated conditions. There are a number of other geometric and safety related considerations at this driveway intersection including grades on George Street and pedestrian sight lines that will need to be considered as the project progresses to design stages. These issues are addressed in greater detail in the discussions and recommendation section of the report.

Similar to the AM peak, operations at this intersection during the PM peak hour remain high will little delay, virtually no queuing and low overall capacity utilization.

### BARRINGTON STREET





# 4.4 George Street and Granville Street

## AM PEAK HOUR

George and Granville		← EBL → EBT → EBR			← WBL → WBT → WBR			← NBL → NBT → NBR			← SBL → SBT → SBR		
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2019 Baseline	Vol, veh/h	30	76					30	42				
	V/C Ratio	0.02	0.05					0.09	0.09				
	Control Delay (s/veh)	7.7	0					16	13.2				
	Lane LOS	A	-					C	B				
	95th %Queue (m)	0.6	0					2.4	2.5				
2024 Background	Vol, veh/h	32	80					32	44				
	V/C Ratio	0.03	0.05					0.1	0.1				
	Control Delay (s/veh)	7.7	0					16.2	13.3				
	Lane LOS	A	-					C	B				
	95th %Queue (veh)	0.6	0					2.6	2.6				
2024 Development	Vol, veh/h	42	103					32	44				
	V/C Ratio	0.03	0.07					0.11	0.1				
	Control Delay (s/veh)	7.7	0					17.1	13.6				
	Lane LOS	A	-					C	B				
	95th %Queue (veh)	0.8	0					2.8	2.7				

## PM PEAK HOUR

George and Granville		← EBL → EBT → EBR			← WBL → WBT → WBR			← NBL → NBT → NBR			← SBL → SBT → SBR		
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2019 Baseline	Vol, veh/h	45	37					40	7				
	V/C Ratio	0.04	0.02					0.12	0.02				
	Control Delay (s/veh)	7.7	0					16.3	12.1				
	Lane LOS	A	-					C	B				
	95th %Queue (m)	0.9	0					3.2	0.4				
2024 Background	Vol, veh/h	47	39					42	7				
	V/C Ratio	0.04	0.02					0.13	0.02				
	Control Delay (s/veh)	7.7	0					16.5	12.1				
	Lane LOS	A	-					C	B				
	95th %Queue (veh)	0.9	0					3.5	0.4				
2024 Development	Vol, veh/h	54	54					42	7				
	V/C Ratio	0.04	0.03					0.13	0.02				
	Control Delay (s/veh)	7.7	0					17.2	12.3				
	Lane LOS	A	-					C	B				
	95th %Queue (veh)	1.1	0					3.7	0.4				

George Street has free flowing lane through the Granville intersection in the eastbound direction with stop control being present northbound on Granville. Given the relatively low volumes of traffic on George Street, the northbound Granville movements can be maintained at a high level of service through all scenarios.

With the addition of development volume to the traffic on George Street, there is very little change to the delay, queues and capacity utilization at the intersection.

Similar to the AM peak, this intersection operates at a high level of service through all scenarios.



# 4.5 Barrington Street and Duke Street

## AM PEAK HOUR

## PM PEAK HOUR

Barrington and Duke		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2019 Baseline	Vol, veh/h		126	62			96		218	11		413	182
	V/C Ratio		0.24	0.19			0.26		0.28	0.02		0.53	0.36
	Control Delay (s/veh)		15.6	5.7			12.9		8.4	1.5		12.8	4.7
	Lane LOS		B	A			B		A	A		B	A
	95th %Queue (m)		22.6	7.2			8.7		11.8	0		32	2.3
2024 Background	Vol, veh/h		132	65			101		229	12		434	191
	V/C Ratio		0.25	0.2			0.28		0.29	0.03		0.55	0.38
	Control Delay (s/veh)		15.7	5.7			13.2		8.7	2.1		13.2	5.2
	Lane LOS		B	A			B		A	A		B	A
	95th %Queue (m)		23.6	7.3			21.3		22.9	0.6		59	13.6
2024 Development	Vol, veh/h		132	68			101		229	12		437	191
	V/C Ratio		0.25	0.2			0.28		0.29	0.03		0.56	0.38
	Control Delay (s/veh)		15.7	5.7			13.2		8.8	2.2		13.3	5.2
	Lane LOS		B	A			B		A	A		B	A
	95th %Queue (m)		23.6	7.6			21.3		23.2	0.6		59.4	13.6

Barrington and Duke		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2019 Baseline	Vol, veh/h		78	45					199	39		348	7
	V/C Ratio		0.15	0.14					0.48			0.44	0.02
	Control Delay (s/veh)		14.6	6					18			11.2	3.3
	Lane LOS		B	A					B			B	A
	95th %Queue (m)		15.2	6.1					40.4			40.6	0
2024 Background	Vol, veh/h		82	47					209	41		366	7
	V/C Ratio		0.16	0.15					0.5			0.47	0.02
	Control Delay (s/veh)		14.7	5.9					18.6			11.8	3.6
	Lane LOS		B	A					B			B	A
	95th %Queue (m)		15.8	6.3					42.7			44	0.1
2024 Development	Vol, veh/h		82	58					209	41		366	7
	V/C Ratio		0.16	0.18					0.5			0.47	0.02
	Control Delay (s/veh)		14.7	5.8					18.6			12.1	3.7
	Lane LOS		B	A					B			B	A
	95th %Queue (m)		15.8	7					42.7			44.7	0.1

Barrington Street in the southbound (inbound) direction experiences the highest volumes during the AM peak hours as commuters enter the downtown core area. Currently this movement operates around 50% of its theoretical capacity, through movements at this intersection are frequently impacted by transit movements from the Scotia Square transit terminal immediately to the north.

The volume of new traffic added to this movement, and in general throughout this intersection is very low and therefore has little impact on operations. Modeling suggest that this intersection will continue to work at a good level of service through all scenarios with the biggest impact to operations coming from the efficiency or inefficiency of bus movements through this intersection as well as the relatively high volume of pedestrians crossing the various legs of the intersection.

Similar to the AM peak, the intersection continues to operate at a good level of service through the PM peak. The modeling results suggest maximum capacity utilization of about 50% though again, there can be a variety of impacts related to inefficiencies caused by pedestrians and buses through this intersection.



# 4.6 Barrington Street and Prince Street

## AM PEAK HOUR

		Barrington and Prince											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2019 Baseline	Vol, veh/h				12	69	22	29	252				385
	V/C Ratio				0.04	0.15	0.08	0.1	0.31				0.5
	Control Delay (s/veh)				14.4	15.4	6.7	8.2	9.3				11.8
	Lane LOS				B	B	A	A	A				B
	95th %Queue (m)				4.3	14.3	4.1	5.6	29.6				47.6
2024 Background	Vol, veh/h				13	73	23	30	265				405
	V/C Ratio				0.04	0.16	0.08	0.11	0.33				0.53
	Control Delay (s/veh)				14.5	15.5	6.9	8.3	9.5				12.5
	Lane LOS				B	B	A	A	A				B
	95th %Queue (m)				4.6	14.9	4.3	5.7	31.1				51
2024 Development	Vol, veh/h				13	73	24	30	268				405
	V/C Ratio				0.04	0.16	0.09	0.11	0.33				0.53
	Control Delay (s/veh)				14.5	15.5	7	8.3	9.5				12.6
	Lane LOS				B	B	A	A	A				B
	95th %Queue (m)				4.6	14.9	4.5	5.7	31.4				51.5

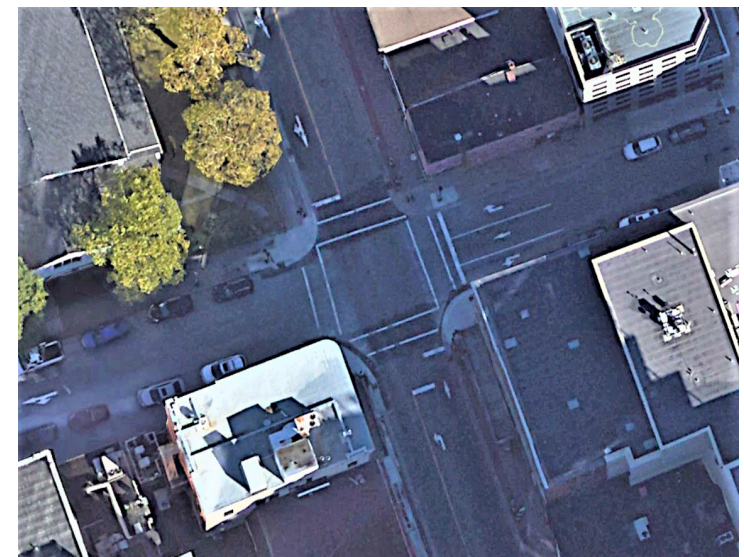
Peak directional volumes are in the southbound (inbound) direction at this intersection with peak v/c ratios of just over 50%. There are relatively low volumes on Prince Street, therefore the majority of traffic signal green time can be attribute to the peak direction movements and therefore there is low levels of delay and queuing at the intersection.

New volumes related to the development adds about 23 vehicles on the various movements through the intersection and therefore the changes in the measures of performance at the intersection due to the development are very small.

## PM PEAK HOUR

		Barrington and Prince												
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
2019 Baseline	Vol, veh/h				14	245	59	41	336				274	28
	V/C Ratio				0.04	0.43	0.17	0.14	0.48					0.44
	Control Delay (s/veh)				11.8	16.2	5	11	13.9					15.9
	Lane LOS				B	B	A	B	B					B
	95th %Queue (m)				4.2	39.8	6.4	8.3	47.8					45
2024 Background	Vol, veh/h				15	257	62	43	353				288	29
	V/C Ratio				0.04	0.46	0.18	0.16	0.5					0.47
	Control Delay (s/veh)				11.8	16.5	5	11.2	14.3					16.6
	Lane LOS				B	B	A	B	B					B
	95th %Queue (m)				4.3	42	6.6	8.7	51					47.7
2024 Development	Vol, veh/h				15	257	65	43	364				288	29
	V/C Ratio				0.04	0.46	0.19	0.15	0.52					0.47
	Control Delay (s/veh)				11.8	16.5	5	11.1	14.5					16.8
	Lane LOS				B	B	A	B	B					B
	95th %Queue (m)				4.3	42	6.7	8.7	53					48.3

Similar to the AM peak hour, this intersection operates at a high level of performance throughout each of the PM peak scenarios.





# 4.7 George Street and Hollis Street

## AM PEAK HOUR

George and Hollis		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2019 Baseline	Vol, veh/h		82	33									814
	V/C Ratio		0.14	0.08									0.57
	Control Delay (s/veh)		11.3	4.2									11.6
	Lane LOS		B	A									B
	95th %Queue (m)		14.5	3.5									49.3
2024 Background	Vol, veh/h		86	35									856
	V/C Ratio		0.15	0.08									0.6
	Control Delay (s/veh)		11.3	4.6									12
	Lane LOS		B	A									B
	95th %Queue (m)		14.6	3.9									52.7
2024 Development	Vol, veh/h		98	46									856
	V/C Ratio		0.17	0.11									0.6
	Control Delay (s/veh)		12.1	5.9									12
	Lane LOS		B	A									B
	95th %Queue (m)		16.6	5.8									52.7

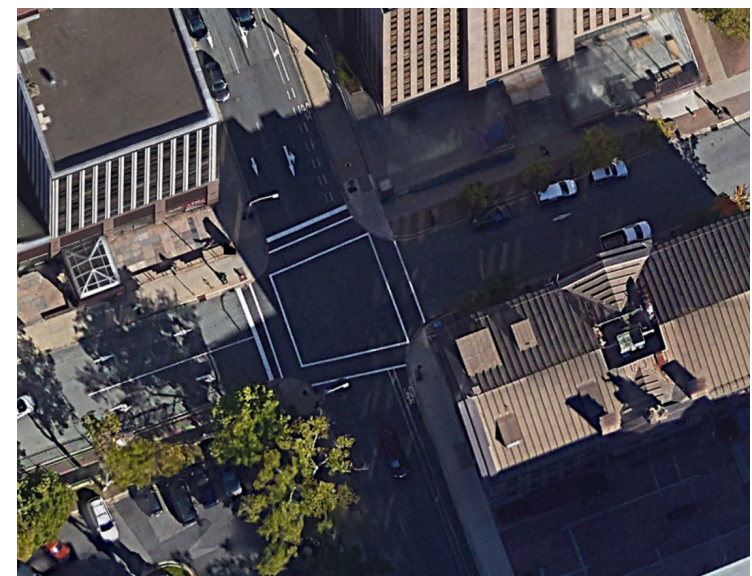
## PM PEAK HOUR

George and Hollis		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2019 Baseline	Vol, veh/h		6	38								29	452
	V/C Ratio		0.01	0.08									0.35
	Control Delay (s/veh)		8.2	4.1									9.6
	Lane LOS		A	A									A
	95th %Queue (m)		1.4	4.1									26.3
2024 Background	Vol, veh/h		6	40								30	475
	V/C Ratio		0.01	0.09									0.36
	Control Delay (s/veh)		8	4									9.8
	Lane LOS		A	A									A
	95th %Queue (m)		1.3	3.8									27.8
2024 Development	Vol, veh/h		14	47								30	475
	V/C Ratio		0.02	0.1									0.36
	Control Delay (s/veh)		8.9	3.6									9.8
	Lane LOS		A	A									A
	95th %Queue (m)		2.7	3.7									27.8

Hollis Street is a parallel inbound commuter route as accommodates over twice the peak hour traffic volumes that Barrington does though due to the two lane cross section, the intersection operates with a capacity utilization of about 60% through all scenarios. This results in limited delay and queuing for vehicles on Hollis Street and for southbound through or right turning vehicles from George Street.

Again the contributions to the overall traffic volume at this intersection related to the development are very small and therefore have little impact on operations at the intersection.

Operations during the PM peak hour are significantly better than the AM peak as the majority of PM peak traffic is outbound from the downtown core and therefore is not able to use Hollis Street. The lower volumes simply mean that the all measures of performance during the PM peak are better than the corresponding movements during the AM peak hour.





# 05 Conclusions and Recommendations



This Transportation Impact Study was prepared to evaluate the impacts of the proposed additions to the Dennis Building Development in downtown Halifax on the surrounding transportation network including roads, intersections and active transportation infrastructure. The proposed development is expected to yield approximately 120-new residential units and be accompanied by ground floor commercial uses that support the local neighbourhood. The proposed development is consistent with adjacent properties and fits well with the surrounding land uses which already include a variety of residential, commercial, office and institutional establishments.

The modeling exercise shows that the volumes generated by the development easily merge into the existing transportation network and have little impact on the surrounding road network or intersection operations. The driveway to the site should be limited to a single enter and exit lane (2-lanes total) and should be designed to integrate with the grades on George Street adjacent to the driveway. As a result of adding a driveway at this location, two parking spaces will need to be removed, or relocated further to the east along George Street (closer to Granville Street). No other infrastructure is required to accommodate the new development vehicle traffic and amply facilities are present to accommodate the active transportation needs of the site.

With respect to active transportation, there are significant volumes of AT traffic in the area and through the intersection of Barrington Street and George Street given the close proximity of Scotia Square and Parade Square. From a pedestrian safety perspective, the existing Dennis structure limits sight lines from the new development's parkade driveway to the east (downstream of the new driveway). While this is not an issue for vehicles as George Street is a one-way eastbound street (requiring sight lines to the upstream west side), it poses some risk to pedestrians approaching the driveway in the westbound direction walking towards

Barrington Street. A variety of options were considered to help remedy this situation, with the most practical solution being to move the pedestrians further away from the building to create better sight lines.

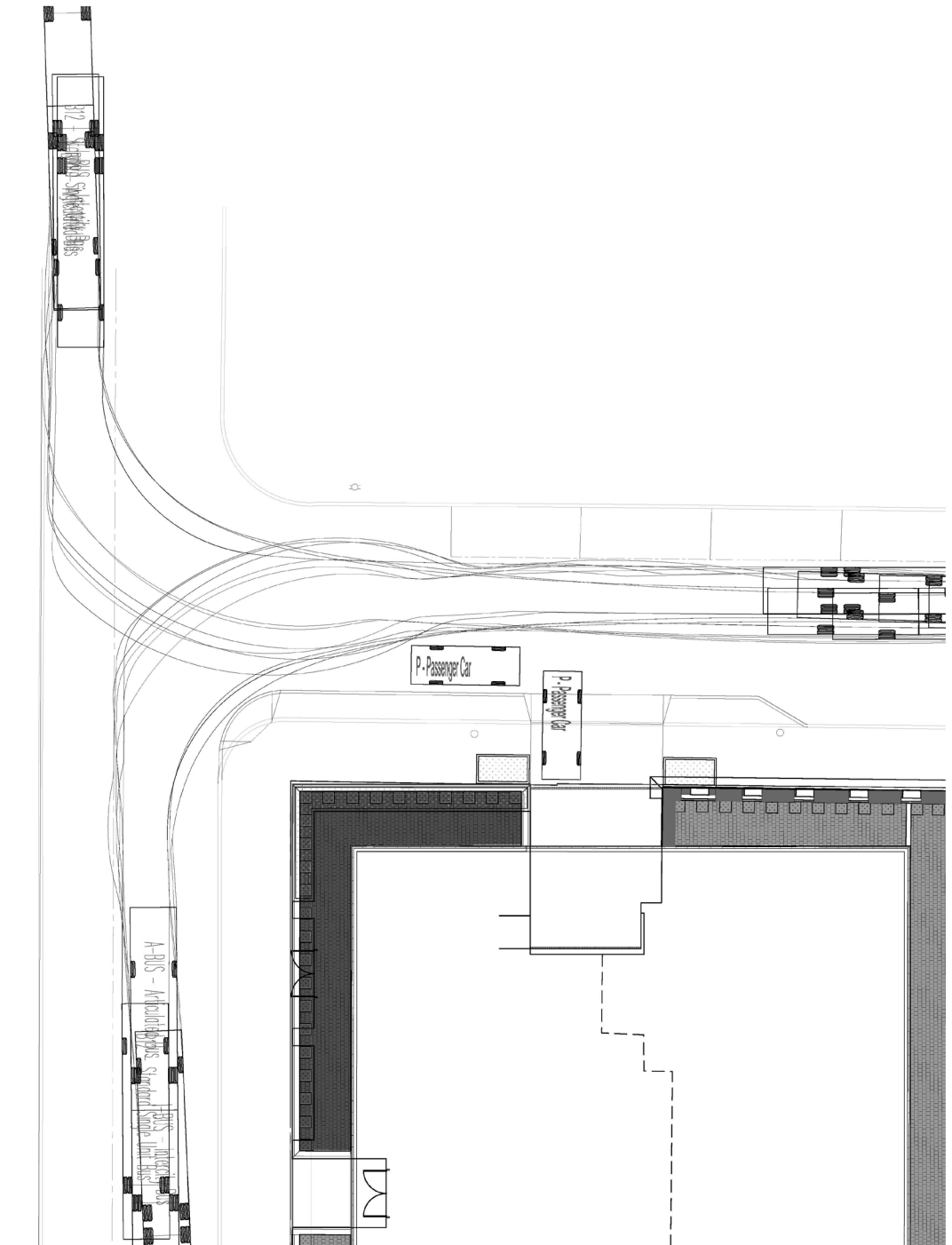
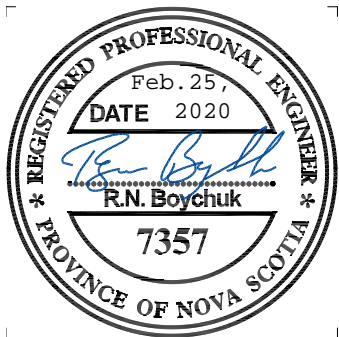
The existing sidewalks are approximately 3 meters in width, which is quite common along zero setback buildings in the downtown core. While generally considered quite wide, it does not provide adequate space to move people off the face of the building and provide adequate space to accommodate the higher pedestrian volumes, curbside amenity space and clear zones along the building. It is recommended to increase the overall sidewalk width near the driveway to provide additional space for pedestrian passage, improve sight lines and to create an improved pedestrian environment. Widening the sidewalk in this manner has a secondary benefit by reducing the excessively wide lane that is currently present on George Street adjacent to the development. Reducing the lane width provides improved guidance to drivers as they enter and traverse the street past the new development.

Further, the expanded pedestrian space adjacent to the development is located directly across from Parade Square and therefore provides a variety of benefits to pedestrians utilizing this intersection such as increase landing areas, improved space for cross-circulation, and the ability to provide greater separation between the pedestrian realm and the traffic on Barrington Street. It is recommended that expansion of this pedestrian space adjacent to the Dennis Development be actively explored as detailed design proceeds on this site.

During various project discussions, questions were raised regarding the ability of buses to turn from Barrington Street onto George Street if the travel lanes on George Street were to be narrowed due to the expansion of the sidewalk space. A turning analysis was completed to evaluate the ability of different buses to turn left and right from Barrington Street onto George Street. The analysis assumed a worse case scenario that includes vehicles parked in the existing on-street parking spaces on the north side (top side in the figure to the right) of George Street as well as a vehicle stopped on the south side of George Street waiting to enter the parkade structure. The analysis included Transportation Association of Canada (TAC) turning templates for single unit buses, intercity buses and articulated buses. A compiled drawing of these movements are shown in the figure to the right and a more detailed drawing of individual movements is provided in Appendix E of this report. The analysis suggests that turn movements can be made onto George Street under this worse case scenario.

We trust that this report satisfies HRM's requirements for the preparation of a development Transportation Impact Study. Should there be any questions or comments regarding the content of the study, please do not hesitate to contact the undersigned.

Roger Boychuk • P Eng • Senior Transportation Engineer  
 www.fathomstudio.ca (formerly Ekistics Planning & Design and Form:Media)  
 1 Starr Lane, Dartmouth, NS B2Y 4V7  
 902 461 2525 x 201 [direct] • 902 233 1152 [mobile]

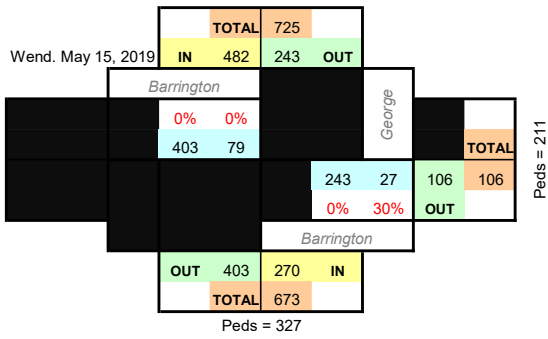
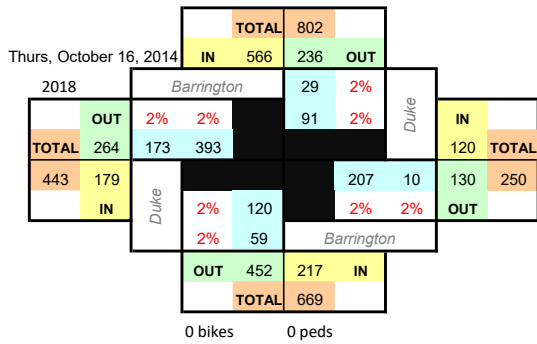


# APPENDIX A

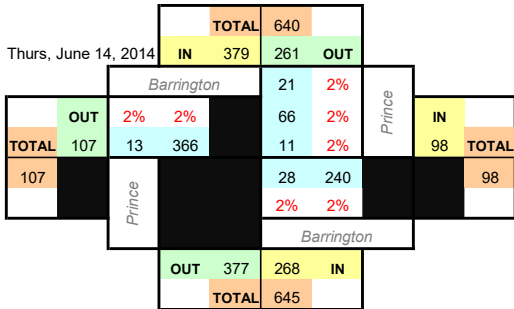
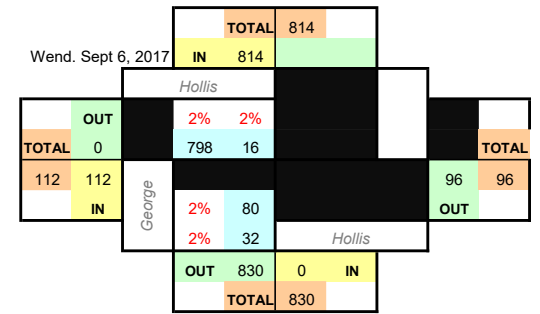
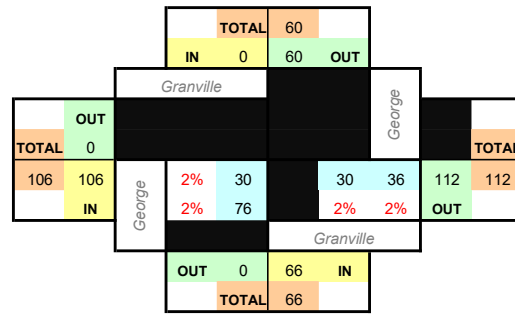
## Appendix A: TRAFFIC COUNTS



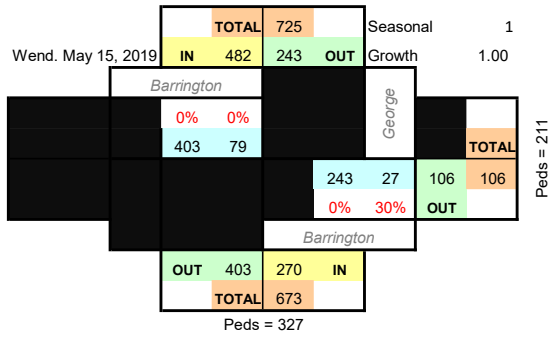
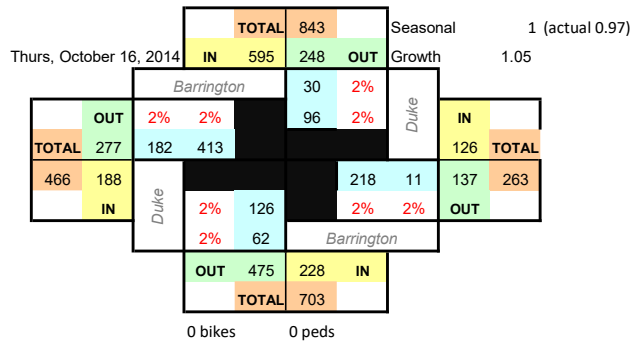
AM - Counts



DRIVEWAY

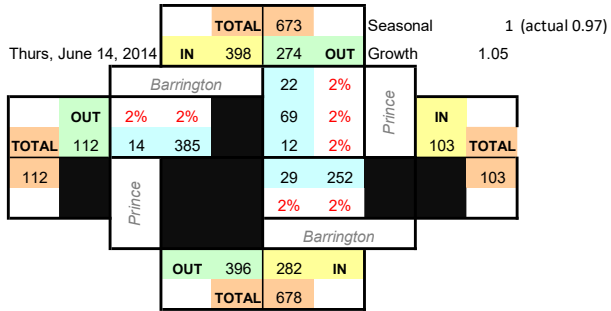
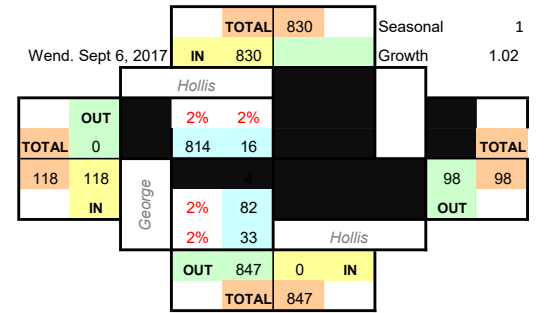
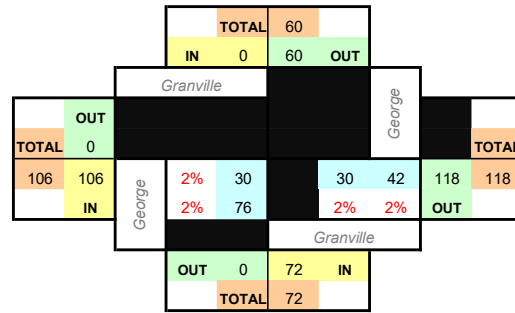


AM BASELINE

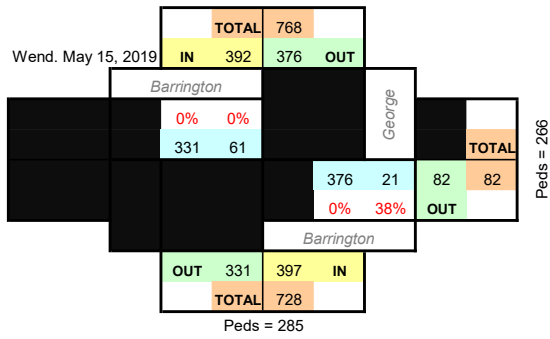
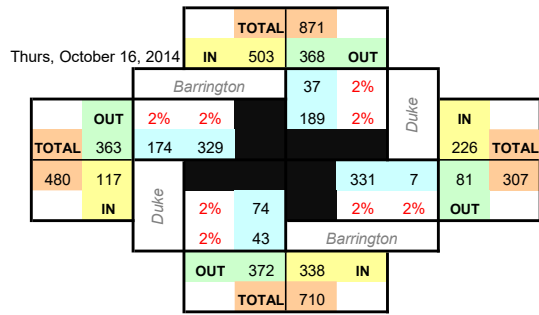


DRIVEWAY

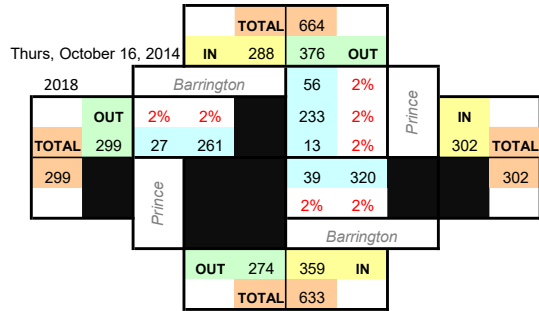
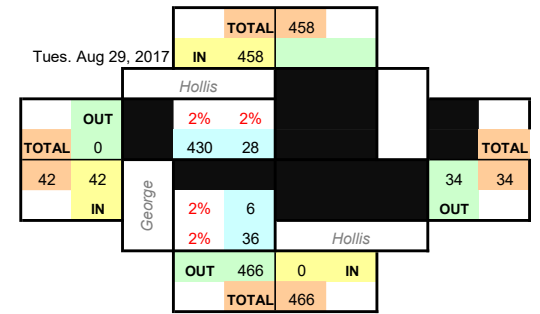
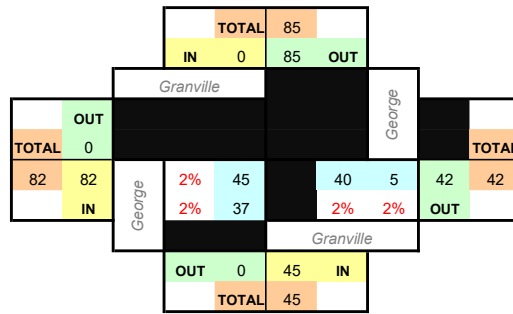
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PM - Counts

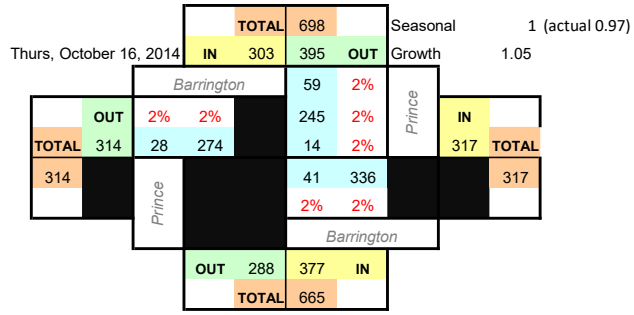
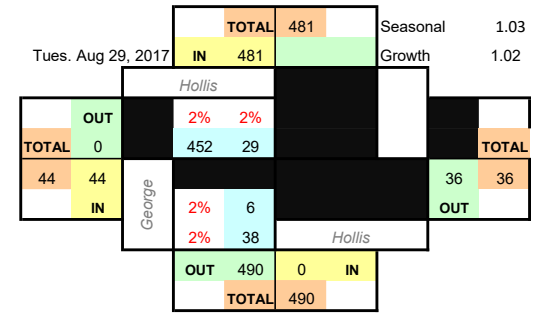
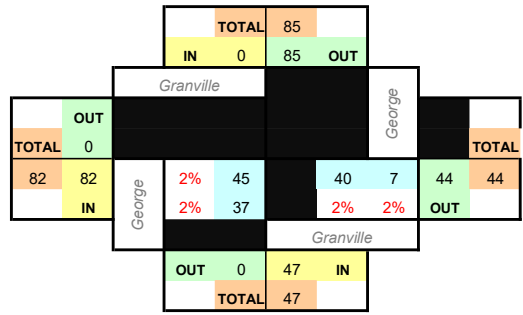
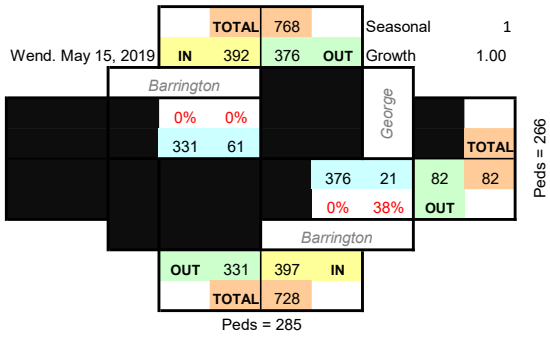
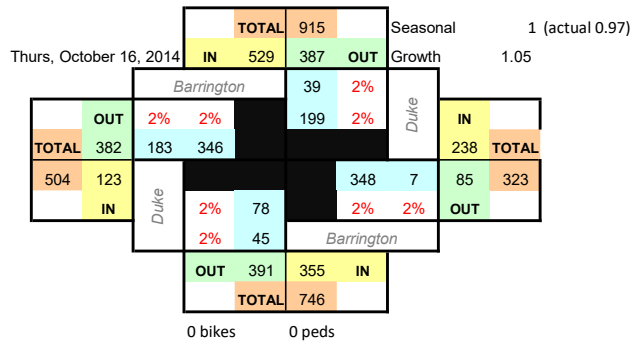


DRIVEWAY





PM BASELINE





Trans4m Group  
129 Craighburn Drive

Dartmouth, Nova Scotia, Canada B2X 3E6  
902-233-1152 Roger@Trans4m.ca  
Trans4m

Count Name: DEXEL - Dennis Building - AM  
Site Code:  
Start Date: 10-23-2019  
Page No: 1

### Turning Movement Data

Start Time	SB Barrington Southbound					EB George Westbound					NB Barrington Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
7:00 AM	56	5	0	0	61	0	0	0	18	0	3	53	0	19	56	117
7:15 AM	76	9	0	0	85	0	0	0	34	0	4	54	0	43	58	143
7:30 AM	68	14	0	1	82	0	0	0	28	0	4	54	0	62	58	140
7:45 AM	79	12	0	1	91	0	0	0	33	0	3	52	0	73	55	146
Hourly Total	279	40	0	2	319	0	0	0	113	0	14	213	0	197	227	546
8:00 AM	91	18	0	0	109	0	0	0	59	0	5	62	0	96	67	176
8:15 AM	103	19	0	0	122	0	0	0	56	0	8	68	0	73	76	198
8:30 AM	106	29	0	0	135	0	0	0	51	0	6	62	0	84	68	203
8:45 AM	103	13	0	0	116	0	0	0	45	0	8	51	0	74	59	175
Hourly Total	403	79	0	0	482	0	0	0	211	0	27	243	0	327	270	752
Grand Total	682	119	0	2	801	0	0	0	324	0	41	456	0	524	497	1298
Approach %	85.1	14.9	0.0	-	-	0.0	0.0	0.0	-	-	8.2	91.8	0.0	-	-	-
Total %	52.5	9.2	0.0	-	61.7	0.0	0.0	0.0	-	0.0	3.2	35.1	0.0	-	38.3	-
Lights	540	90	0	-	630	0	0	0	-	0	38	385	0	-	423	1053
% Lights	79.2	75.6	-	-	78.7	-	-	-	-	-	92.7	84.4	-	-	85.1	81.1
Buses	127	22	0	-	149	0	0	0	-	0	0	61	0	-	61	210
% Buses	18.6	18.5	-	-	18.6	-	-	-	-	-	0.0	13.4	-	-	12.3	16.2
Trucks	13	5	0	-	18	0	0	0	-	0	0	7	0	-	7	25
% Trucks	1.9	4.2	-	-	2.2	-	-	-	-	-	0.0	1.5	-	-	1.4	1.9
Bicycles on Road	2	2	0	-	4	0	0	0	-	0	3	3	0	-	6	10
% Bicycles on Road	0.3	1.7	-	-	0.5	-	-	-	-	-	7.3	0.7	-	-	1.2	0.8
Pedestrians	-	-	-	2	-	-	-	-	324	-	-	-	-	524	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-





Trans4m Group  
129 Craighburn Drive

Dartmouth, Nova Scotia, Canada B2X 3E6  
902-233-1152 Roger@Trans4m.ca  
Trans4m

Count Name: DEXEL - Dennis Building - AM  
Site Code:  
Start Date: 10-23-2019  
Page No: 3

### Turning Movement Peak Hour Data (8:00 AM)

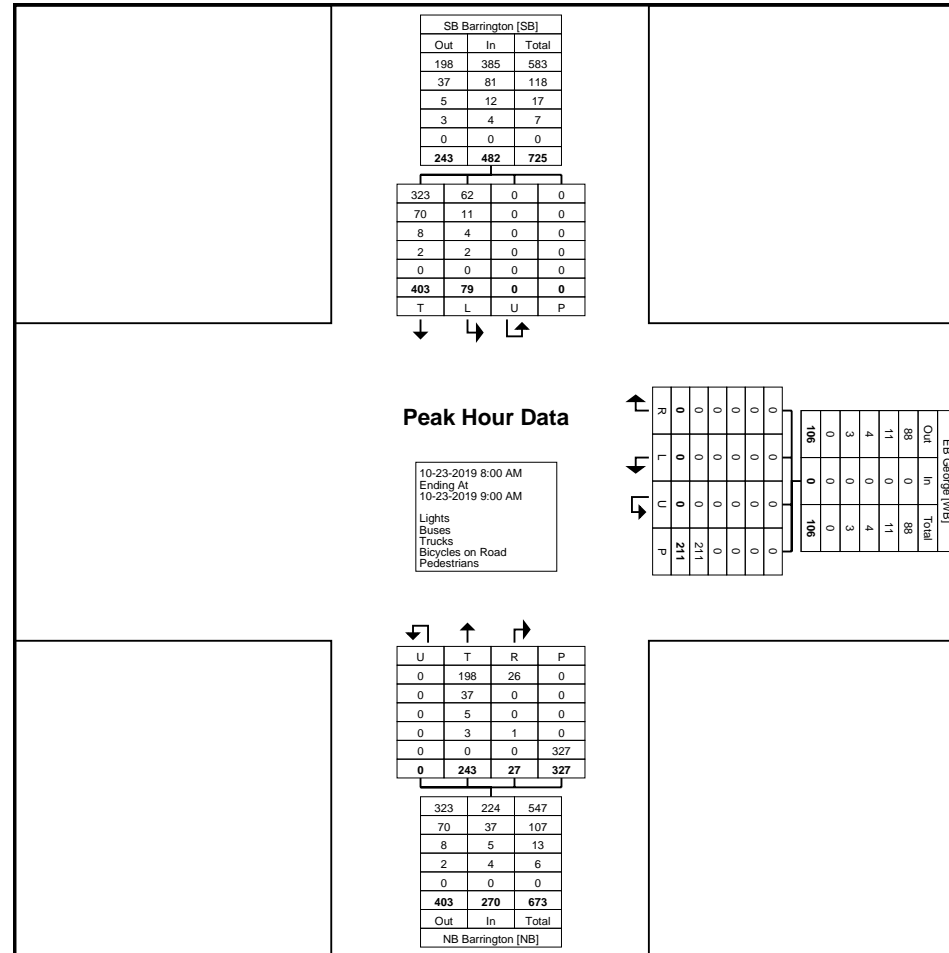
Start Time	SB Barrington Southbound					EB George Westbound					NB Barrington Northbound				Int. Total	
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds		App. Total
8:00 AM	91	18	0	0	109	0	0	0	59	0	5	62	0	96	67	176
8:15 AM	103	19	0	0	122	0	0	0	56	0	8	68	0	73	76	198
8:30 AM	106	29	0	0	135	0	0	0	51	0	6	62	0	84	68	203
8:45 AM	103	13	0	0	116	0	0	0	45	0	8	51	0	74	59	175
Total	403	79	0	0	482	0	0	0	211	0	27	243	0	327	270	752
Approach %	83.6	16.4	0.0	-	-	0.0	0.0	0.0	-	-	10.0	90.0	0.0	-	-	-
Total %	53.6	10.5	0.0	-	64.1	0.0	0.0	0.0	-	0.0	3.6	32.3	0.0	-	35.9	-
PHF	0.950	0.681	0.000	-	0.893	0.000	0.000	0.000	-	0.000	0.844	0.893	0.000	-	0.888	0.926
Lights	323	62	0	-	385	0	0	0	-	0	26	198	0	-	224	609
% Lights	80.1	78.5	-	-	79.9	-	-	-	-	-	96.3	81.5	-	-	83.0	81.0
Buses	70	11	0	-	81	0	0	0	-	0	0	37	0	-	37	118
% Buses	17.4	13.9	-	-	16.8	-	-	-	-	-	0.0	15.2	-	-	13.7	15.7
Trucks	8	4	0	-	12	0	0	0	-	0	0	5	0	-	5	17
% Trucks	2.0	5.1	-	-	2.5	-	-	-	-	-	0.0	2.1	-	-	1.9	2.3
Bicycles on Road	2	2	0	-	4	0	0	0	-	0	1	3	0	-	4	8
% Bicycles on Road	0.5	2.5	-	-	0.8	-	-	-	-	-	3.7	1.2	-	-	1.5	1.1
Pedestrians	-	-	-	0	-	-	-	-	211	-	-	-	-	327	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Trans4m Group  
129 Craighburn Drive

Dartmouth, Nova Scotia, Canada B2X 3E6  
902-233-1152 Roger@Trans4m.ca  
Trans4m

Count Name: DEXEL - Dennis Building - AM  
Site Code:  
Start Date: 10-23-2019  
Page No: 4



Turning Movement Peak Hour Data Plot (8:00 AM)





Trans4m Group  
129 Craighburn Drive

Dartmouth, Nova Scotia, Canada B2X 3E6  
902-233-1152 Roger@Trans4m.ca  
Trans4m

Count Name: DEXEL - Dennis Building - PM  
Site Code:  
Start Date: 10-22-2019  
Page No: 1

### Turning Movement Data

Start Time	SB Barrington Southbound					EB George Westbound					NB Barrington Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
4:00 PM	73	18	0	0	91	0	0	0	74	0	3	111	0	117	114	205
4:15 PM	72	16	0	2	88	0	0	0	60	0	5	98	0	65	103	191
4:30 PM	61	14	0	4	75	1	0	0	96	1	8	89	0	113	97	173
4:45 PM	85	14	0	0	99	0	0	0	68	0	5	101	0	87	106	205
Hourly Total	291	62	0	6	353	1	0	0	298	1	21	399	0	382	420	774
5:00 PM	86	12	0	0	98	0	0	0	76	0	6	114	0	82	120	218
5:15 PM	84	15	1	4	100	0	0	0	58	0	4	90	0	56	94	194
5:30 PM	76	20	0	0	96	0	0	1	64	1	6	71	0	60	77	174
5:45 PM	70	11	0	1	81	0	0	0	45	0	8	95	0	44	103	184
Hourly Total	316	58	1	5	375	0	0	1	243	1	24	370	0	242	394	770
Grand Total	607	120	1	11	728	1	0	1	541	2	45	769	0	624	814	1544
Approach %	83.4	16.5	0.1	-	-	50.0	0.0	50.0	-	-	5.5	94.5	0.0	-	-	-
Total %	39.3	7.8	0.1	-	47.2	0.1	0.0	0.1	-	0.1	2.9	49.8	0.0	-	52.7	-
Lights	526	77	1	-	604	1	0	1	-	2	43	648	0	-	691	1297
% Lights	86.7	64.2	100.0	-	83.0	100.0	-	100.0	-	100.0	95.6	84.3	-	-	84.9	84.0
Buses	78	41	0	-	119	0	0	0	-	0	0	113	0	-	113	232
% Buses	12.9	34.2	0.0	-	16.3	0.0	-	0.0	-	0.0	0.0	14.7	-	-	13.9	15.0
Trucks	0	0	0	-	0	0	0	0	-	0	1	5	0	-	6	6
% Trucks	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	2.2	0.7	-	-	0.7	0.4
Bicycles on Road	3	2	0	-	5	0	0	0	-	0	1	3	0	-	4	9
% Bicycles on Road	0.5	1.7	0.0	-	0.7	0.0	-	0.0	-	0.0	2.2	0.4	-	-	0.5	0.6
Pedestrians	-	-	-	11	-	-	-	-	541	-	-	-	-	624	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Trans4m Group  
129 Craighburn Drive

Dartmouth, Nova Scotia, Canada B2X 3E6  
902-233-1152 Roger@Trans4m.ca  
Trans4m

Count Name: DEXEL - Dennis Building - PM  
Site Code:  
Start Date: 10-22-2019  
Page No: 3

### Turning Movement Peak Hour Data (4:45 PM)

Start Time	SB Barrington Southbound					EB George Westbound					NB Barrington Northbound				Int. Total	
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds		App. Total
4:45 PM	85	14	0	0	99	0	0	0	68	0	5	101	0	87	106	205
5:00 PM	86	12	0	0	98	0	0	0	76	0	6	114	0	82	120	218
5:15 PM	84	15	1	4	100	0	0	0	58	0	4	90	0	56	94	194
5:30 PM	76	20	0	0	96	0	0	1	64	1	6	71	0	60	77	174
Total	331	61	1	4	393	0	0	1	266	1	21	376	0	285	397	791
Approach %	84.2	15.5	0.3	-	-	0.0	0.0	100.0	-	-	5.3	94.7	0.0	-	-	-
Total %	41.8	7.7	0.1	-	49.7	0.0	0.0	0.1	-	0.1	2.7	47.5	0.0	-	50.2	-
PHF	0.962	0.763	0.250	-	0.983	0.000	0.000	0.250	-	0.250	0.875	0.825	0.000	-	0.827	0.907
Lights	289	41	1	-	331	0	0	1	-	1	19	322	0	-	341	673
% Lights	87.3	67.2	100.0	-	84.2	-	-	100.0	-	100.0	90.5	85.6	-	-	85.9	85.1
Buses	40	20	0	-	60	0	0	0	-	0	0	51	0	-	51	111
% Buses	12.1	32.8	0.0	-	15.3	-	-	0.0	-	0.0	0.0	13.6	-	-	12.8	14.0
Trucks	0	0	0	-	0	0	0	0	-	0	1	2	0	-	3	3
% Trucks	0.0	0.0	0.0	-	0.0	-	-	0.0	-	0.0	4.8	0.5	-	-	0.8	0.4
Bicycles on Road	2	0	0	-	2	0	0	0	-	0	1	1	0	-	2	4
% Bicycles on Road	0.6	0.0	0.0	-	0.5	-	-	0.0	-	0.0	4.8	0.3	-	-	0.5	0.5
Pedestrians	-	-	-	4	-	-	-	-	266	-	-	-	-	285	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

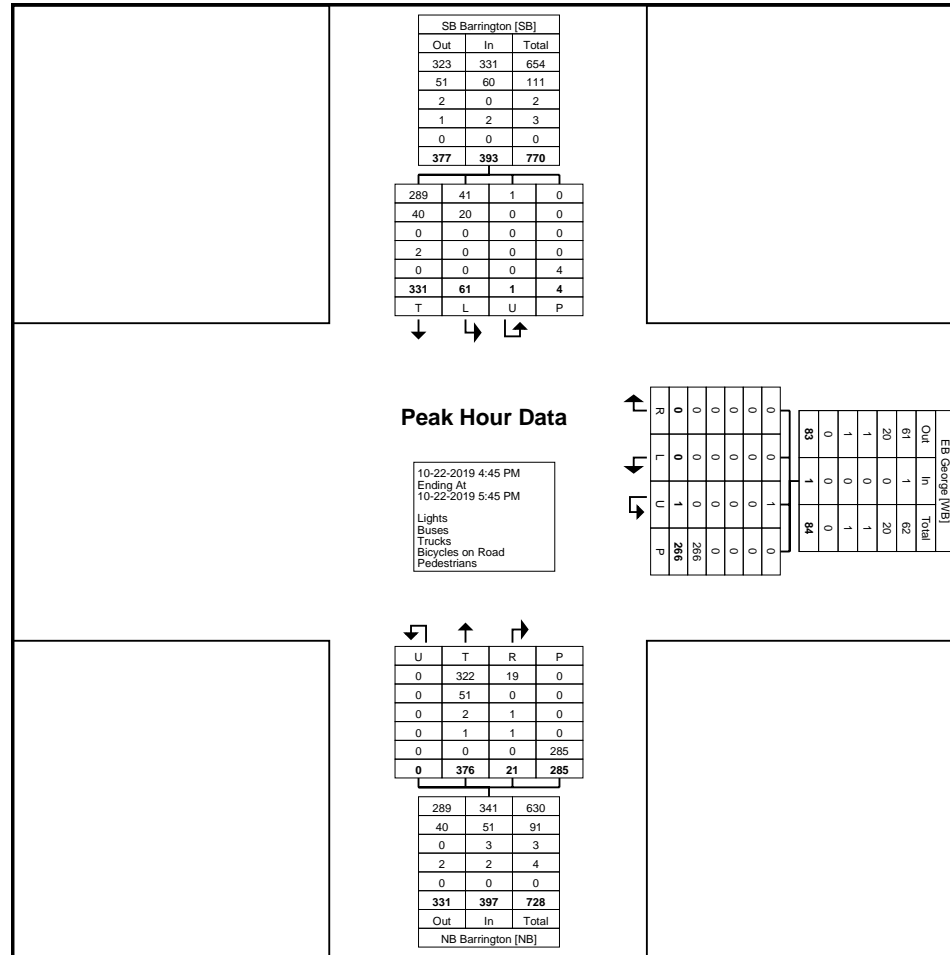




Trans4m Group  
129 Craighburn Drive

Dartmouth, Nova Scotia, Canada B2X 3E6  
902-233-1152 Roger@Trans4m.ca  
Trans4m

Count Name: DEXEL - Dennis Building - PM  
Site Code:  
Start Date: 10-22-2019  
Page No: 4



Turning Movement Peak Hour Data Plot (4:45 PM)

# MANUAL TRAFFIC COUNTS

INTERSECTION:				BARRINGTON STREET AT DUKE STREET										WEATHER RECORDER		CLEAR MIO	
DAY	DATE	MONTH	YEAR														
THURS.	16	OCT.	2014														

STREET: TIME: 15 MIN INTERVALS		DUKE STREET			DUKE STREET			BARRINGTON STREET			BARRINGTON STREET			TOTAL
		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			
		L	S	R	L	S	R	L	S	R	L	S	R	
7:00:00 AM	7:15:00 AM	0	7	6	0	21	6	0	41	21	0	32	1	135
7:15:00 AM	7:30:00 AM	0	15	5	0	24	10	0	61	38	0	42	1	196
7:30:00 AM	7:45:00 AM	0	22	4	0	28	15	0	74	34	0	40	1	218
7:45:00 AM	8:00:00 AM	0	26	10	1	28	13	0	79	61	0	66	0	284

TOTAL	0	70	25	1	101	44	0	255	154	0	180	3	833	
PEAK				95			146			409			183	
15 MIN PEAK				144			172			560			264	
PEAK HOUR FACTOR				0.66			0.85			0.73			0.69	
TWO WAY TOTALS				199			370			615			482	
														PEAK HR FACTOR
														0.97
														808

DAY	DATE	MONTH	YEAR
THURS.	16	OCT.	2014

TIME: 15 MIN INTERVALS		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
8:00:00 AM	8:15:00 AM	0	27	7	1	30	16	0	102	30	1	54	2	270
8:15:00 AM	8:30:00 AM	0	24	10	0	30	16	0	104	54	0	44	2	284
8:30:00 AM	8:45:00 AM	1	19	9	0	26	10	0	87	49	1	55	2	259
8:45:00 AM	9:00:00 AM	0	21	3	0	34	17	1	100	40	0	54	4	274

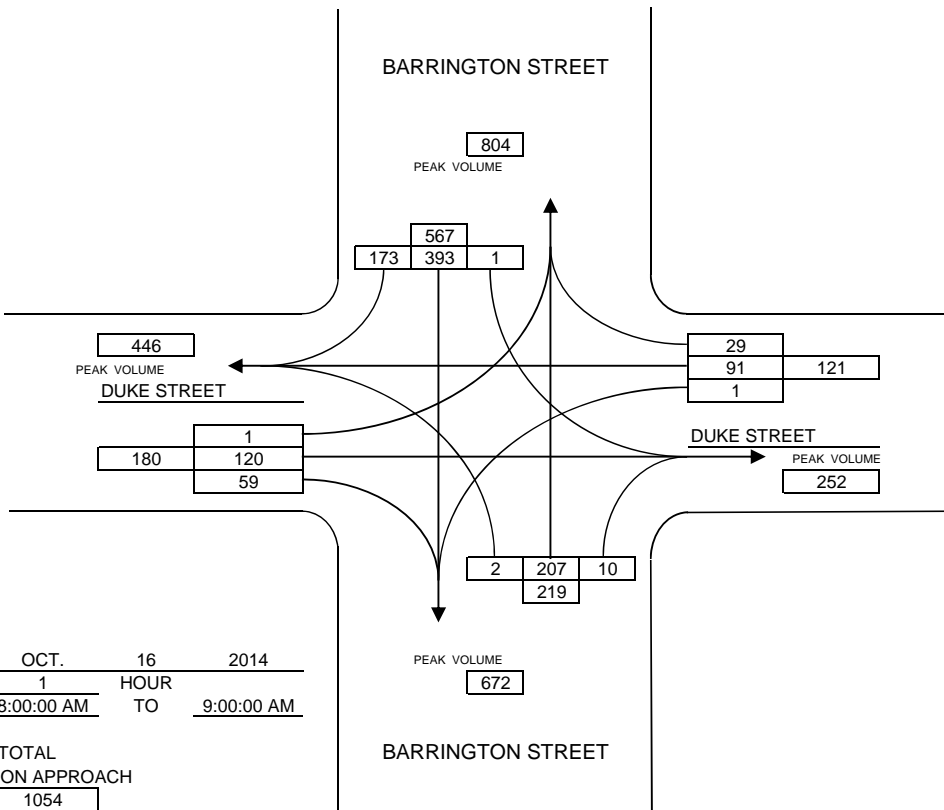
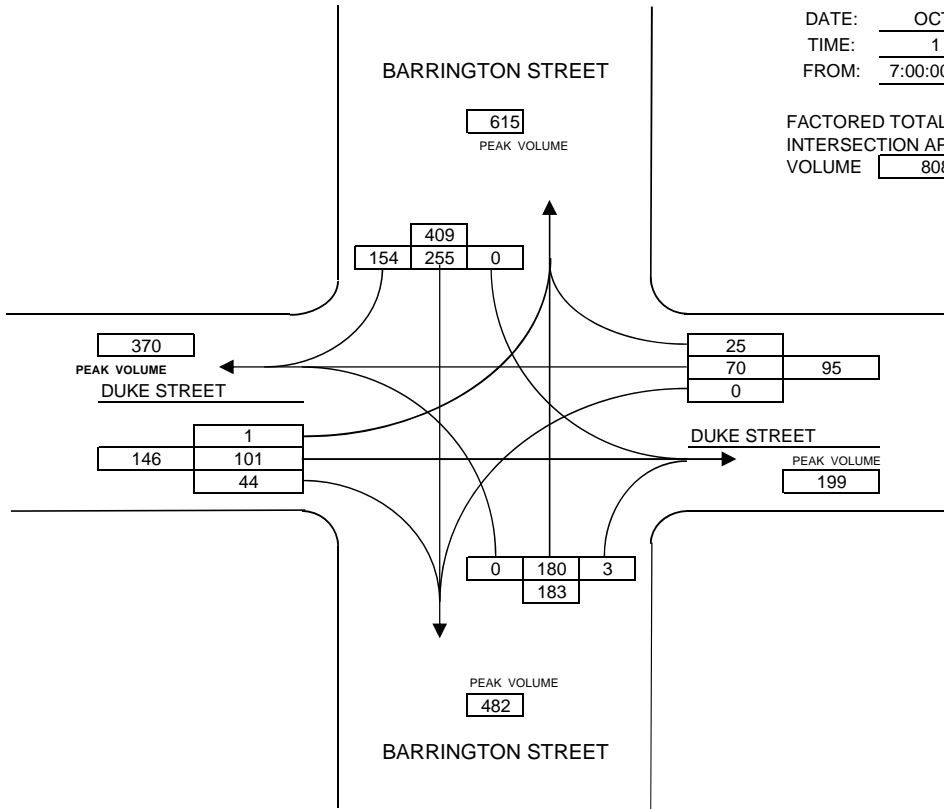
TOTAL	1	91	29	1	120	59	1	393	173	2	207	10	1087	
PEAK				121			180			567			219	
15 MIN PEAK				136			204			632			232	
PEAK HOUR FACTOR				0.89			0.88			0.9			0.94	
TWO WAY TOTALS				252			446			804			672	
														PEAK HR FACTOR
														0.97
														1054

**VEHICULAR GRAPHIC SUMMARY SHEET**  
**BARRINGTON STREET AT DUKE STREET**

INTERSECTION :

DATE: OCT. 16 2014  
 TIME: 1 HOUR  
 FROM: 7:00:00 AM TO 8:00:00 AM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 808



DATE: OCT. 16 2014  
 TIME: 1 HOUR  
 FROM: 8:00:00 AM TO 9:00:00 AM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 1054



# MANUAL TRAFFIC COUNTS

INTERSECTION:				BARRINGTON STREET AT DUKE STREET										WEATHER RECORDER		CLEAR MIO	
DAY	DATE	MONTH	YEAR														
THURS.	16	OCT.	2014														

STREET: TIME: 15 MIN INTERVALS		DUKE STREET			DUKE STREET			BARRINGTON STREET			BARRINGTON STREET			TOTAL
		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			
		L	S	R	L	S	R	L	S	R	L	S	R	
4:00:00 PM	4:15:00 PM	0	37	17	1	17	10	0	54	43	0	85	1	265
4:15:00 PM	4:30:00 PM	0	34	20	3	12	13	0	73	54	0	95	4	308
4:30:00 PM	4:45:00 PM	0	45	20	0	19	11	0	69	32	1	81	2	280
4:45:00 PM	5:00:00 PM	0	35	18	0	18	16	0	76	50	0	83	2	298

TOTAL	0	151	75	4	66	50	0	272	179	1	344	9	1151
PEAK		226			120			451			354		
15 MIN PEAK		260			136			508			396		
PEAK HOUR FACTOR		0.87			0.88			0.89			0.89		PEAK HR FACTOR
TWO WAY TOTALS		301			451			874			676		0.97
													1116

DAY	DATE	MONTH	YEAR
THURS.	16	OCT.	2014

TIME: 15 MIN INTERVALS		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
5:00:00 PM	5:15:00 PM	0	61	10	1	21	6	0	70	51	1	94	1	316
5:15:00 PM	5:30:00 PM	0	48	6	2	19	14	0	82	41	0	96	3	311
5:30:00 PM	5:45:00 PM	1	53	9	0	19	13	0	86	46	0	74	2	303
5:45:00 PM	6:00:00 PM	0	27	12	2	15	10	0	91	36	2	67	1	263

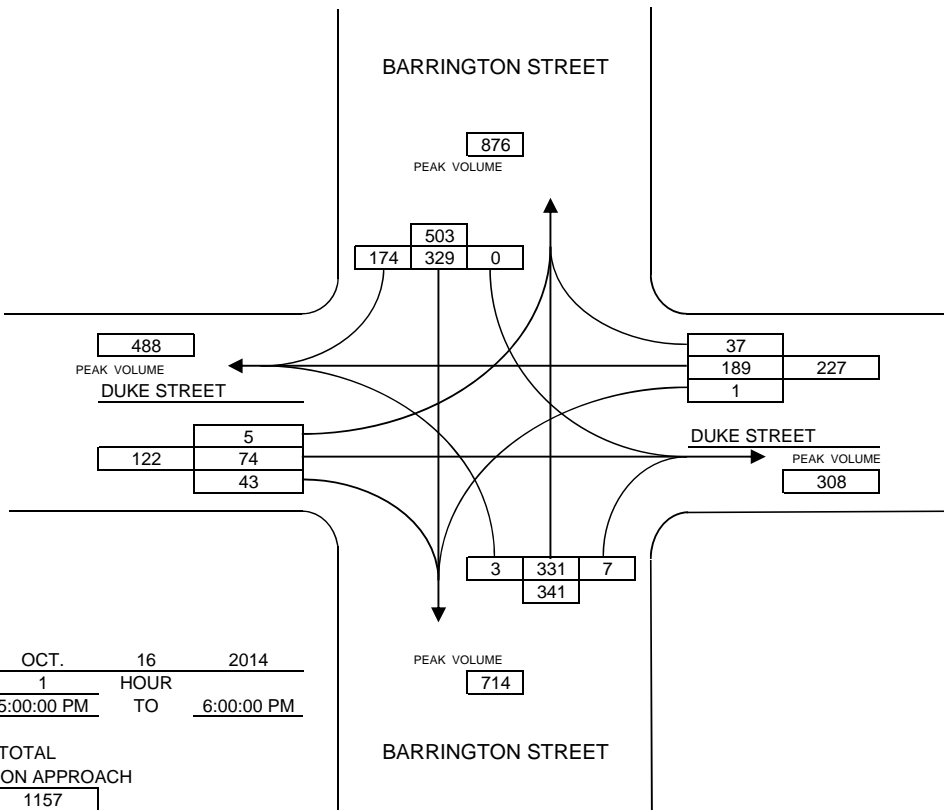
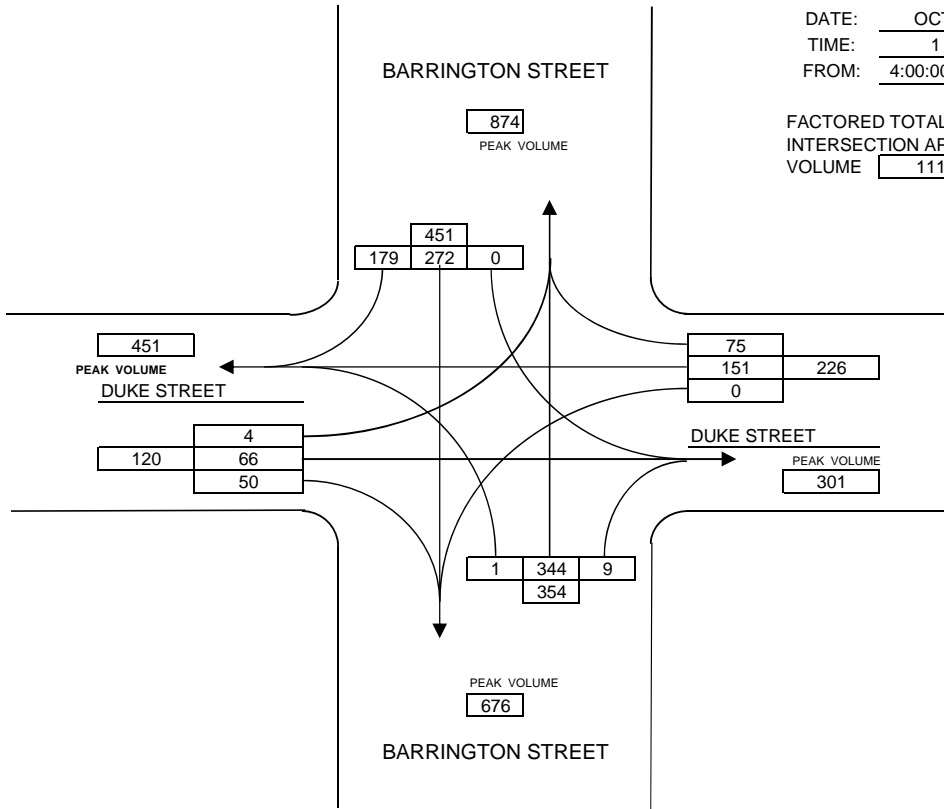
TOTAL	1	189	37	5	74	43	0	329	174	3	331	7	1193
PEAK		227			122			503			341		
15 MIN PEAK		284			140			528			396		
PEAK HOUR FACTOR		0.8			0.87			0.95			0.86		PEAK HR FACTOR
TWO WAY TOTALS		308			488			876			714		0.97
													1157

VEHICULAR GRAPHIC SUMMARY SHEET  
BARRINGTON STREET AT DUKE STREET

INTERSECTION :

DATE: OCT. 16 2014  
 TIME: 1 HOUR  
 FROM: 4:00:00 PM TO 5:00:00 PM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 1116

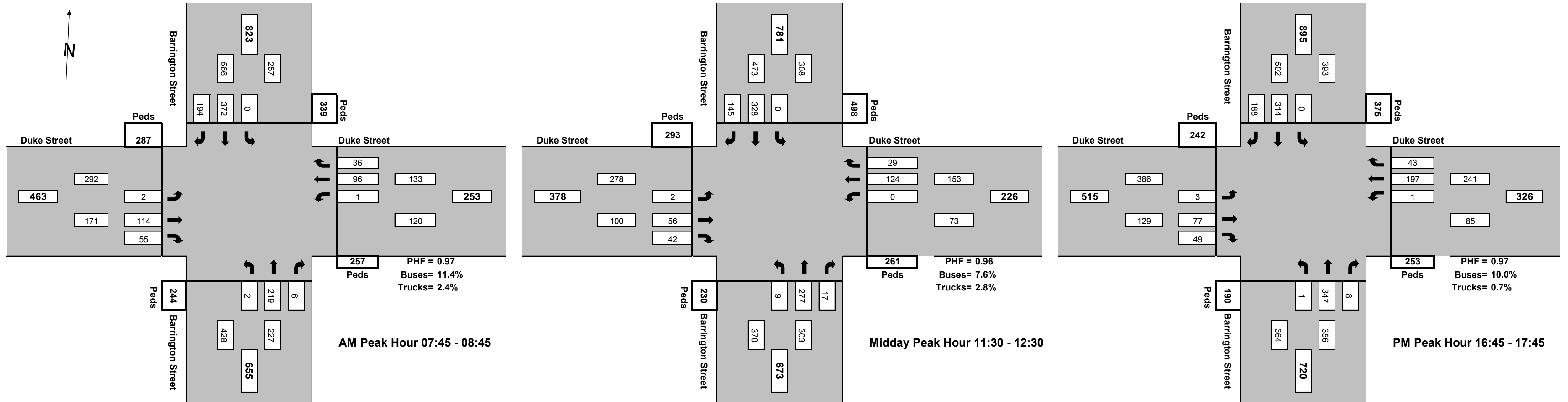


DATE: OCT. 16 2014  
 TIME: 1 HOUR  
 FROM: 5:00:00 PM TO 6:00:00 PM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 1157

## Halifax Traffic Count Intersection Volumes - AM, Midday, and PM Weekday Peak Hours

### HRM - Barrington Street at Duke Street





# MANUAL TRAFFIC COUNTS

INTERSECTION:				BARRINGTON STREET AT PRINCE STREET										WEATHER RECORDER		CLEAR MIO	
DAY	DATE	MONTH	YEAR														
THURS.	16	OCT.	2014														

STREET: TIME: 15 MIN INTERVALS		PRINCE STREET			PRINCE STREET			BARRINGTON STREET			BARRINGTON STREET			TOTAL
		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			
L	S	R	L	S	R	L	S	R	L	S	R			
7:00:00 AM	7:15:00 AM	5	9	5	0	0	0	5	31	1	3	34	0	93
7:15:00 AM	7:30:00 AM	1	14	4	0	0	0	2	52	2	5	45	0	125
7:30:00 AM	7:45:00 AM	2	15	5	0	0	0	0	68	1	3	37	0	131
7:45:00 AM	8:00:00 AM	5	12	2	0	0	0	2	66	2	4	62	0	155

TOTAL	13	50	16	0	0	0	9	217	6	15	178	0	504
PEAK	79			0			232			193			
15 MIN PEAK	88			0			280			264			
PEAK HOUR FACTOR	0.9			0			0.83			0.73			PEAK HR FACTOR
TWO WAY TOTALS	88			71			426			423			
													0.97
													489

DAY	DATE	MONTH	YEAR
THURS.	16	OCT.	2014

TIME: 15 MIN INTERVALS		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
8:00:00 AM	8:15:00 AM	3	19	6	0	0	0	0	94	6	6	79	0	213
8:15:00 AM	8:30:00 AM	2	13	6	0	0	0	0	102	2	10	52	0	187
8:30:00 AM	8:45:00 AM	0	18	5	0	0	0	0	89	3	6	57	0	178
8:45:00 AM	9:00:00 AM	6	16	4	0	0	0	0	81	2	6	52	0	167

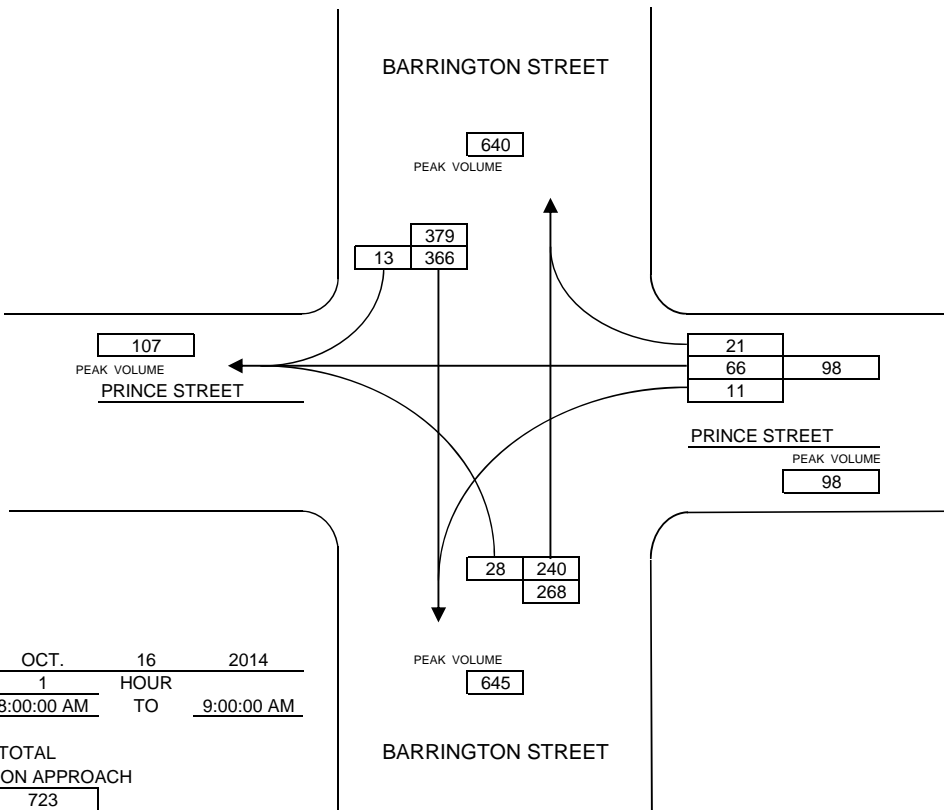
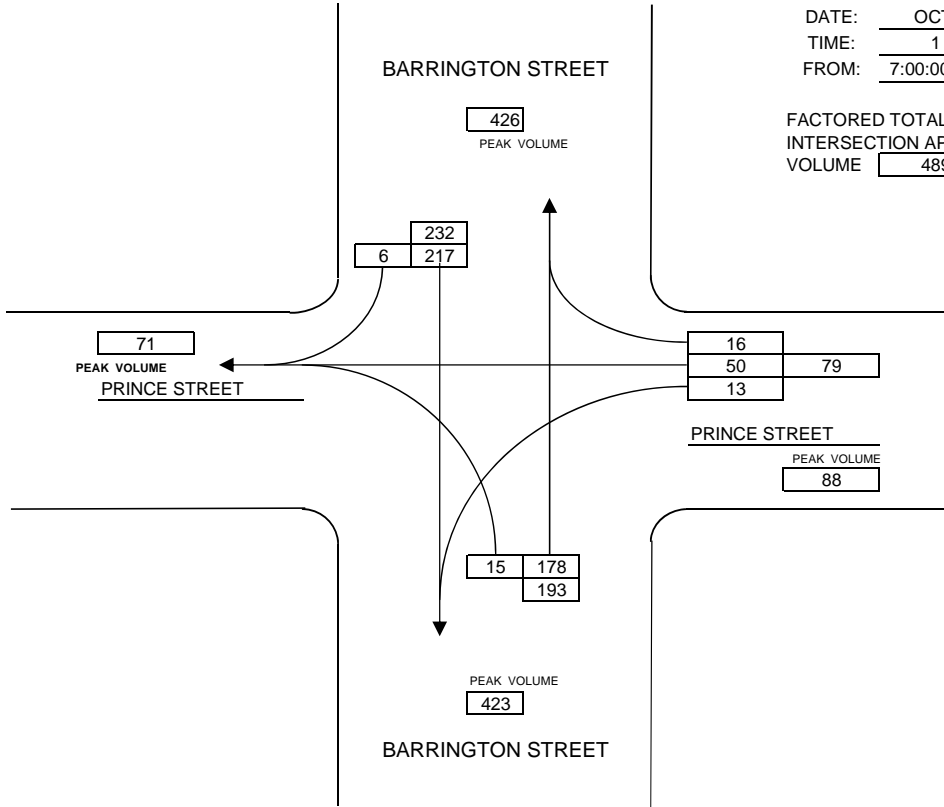
TOTAL	11	66	21	0	0	0	0	366	13	28	240	0	745
PEAK	98			0			379			268			
15 MIN PEAK	112			0			416			340			
PEAK HOUR FACTOR	0.88			0			0.91			0.79			PEAK HR FACTOR
TWO WAY TOTALS	98			107			640			645			
													0.97
													723

VEHICULAR GRAPHIC SUMMARY SHEET  
BARRINGTON STREET AT PRINCE STREET

INTERSECTION :

DATE: OCT. 16 2014  
 TIME: 1 HOUR  
 FROM: 7:00:00 AM TO 8:00:00 AM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 489



DATE: OCT. 16 2014  
 TIME: 1 HOUR  
 FROM: 8:00:00 AM TO 9:00:00 AM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 723

# MANUAL TRAFFIC COUNTS

INTERSECTION:				BARRINGTON STREET AT PRINCE STREET										WEATHER RECORDER		CLEAR MIO	
DAY	DATE	MONTH	YEAR														
THURS.	16	OCT.	2014														

TIME: 15 MIN INTERVALS		PRINCE STREET FROM THE EAST			PRINCE STREET FROM THE WEST			BARRINGTON STREET FROM THE NORTH			BARRINGTON STREET FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
4:00:00 PM	4:15:00 PM	3	50	22	0	0	0	0	55	8	7	75	0	220
4:15:00 PM	4:30:00 PM	2	56	13	0	0	0	0	68	11	13	84	0	247
4:30:00 PM	4:45:00 PM	3	70	12	0	0	0	0	66	4	8	80	0	243
4:45:00 PM	5:00:00 PM	5	57	9	0	0	0	0	72	4	11	81	0	239

TOTAL	13	233	56	0	0	0	0	261	27	39	320	0	949
PEAK		302			0			288			359		
15 MIN PEAK		340			0			316			388		
PEAK HOUR FACTOR		0.89			0			0.91			0.93		PEAK HR FACTOR
TWO WAY TOTALS		302			299			664			633		0.97
													921

DAY	DATE	MONTH	YEAR
THURS.	16	OCT.	2014

TIME: 15 MIN INTERVALS		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
5:00:00 PM	5:15:00 PM	3	68	7	0	0	0	0	63	3	8	94	0	246
5:15:00 PM	5:30:00 PM	4	34	8	0	0	0	0	79	10	15	94	0	244
5:30:00 PM	5:45:00 PM	6	42	13	0	0	0	0	78	10	7	80	0	236
5:45:00 PM	6:00:00 PM	5	30	12	0	0	0	0	73	9	8	78	0	215

TOTAL	18	174	40	0	0	0	0	293	32	38	346	0	941
PEAK		232			0			325			384		
15 MIN PEAK		312			0			356			436		
PEAK HOUR FACTOR		0.74			0			0.91			0.88		PEAK HR FACTOR
TWO WAY TOTALS		232			244			711			695		0.97
													913

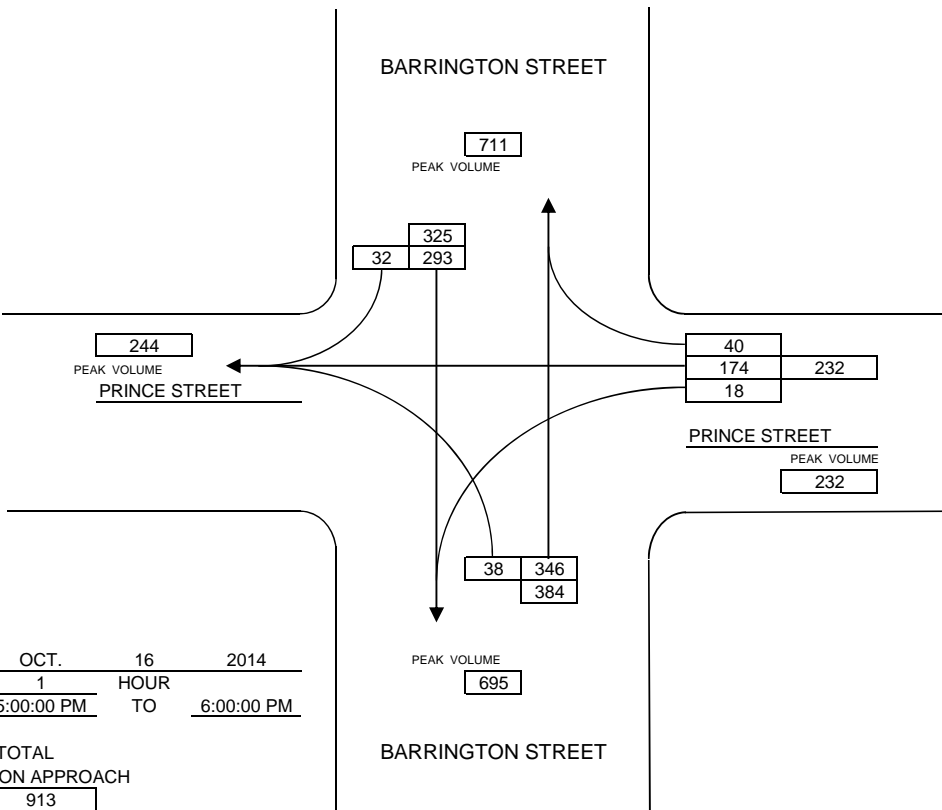
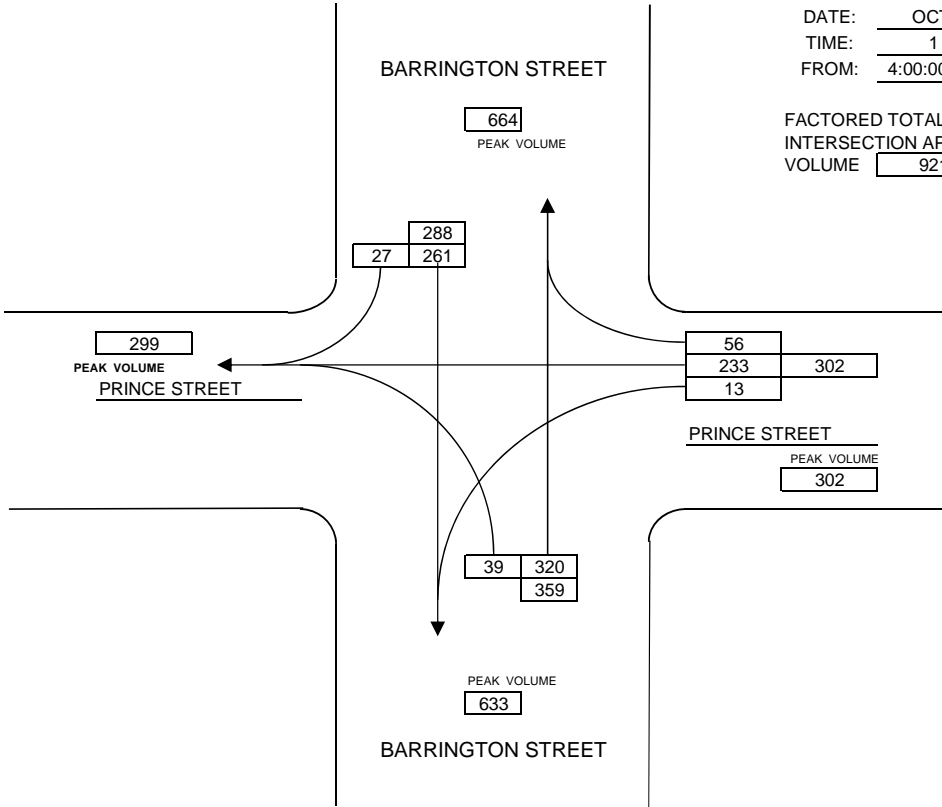


VEHICULAR GRAPHIC SUMMARY SHEET  
BARRINGTON STREET AT PRINCE STREET

INTERSECTION :

DATE: OCT. 16 2014  
 TIME: 1 HOUR  
 FROM: 4:00:00 PM TO 5:00:00 PM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 921

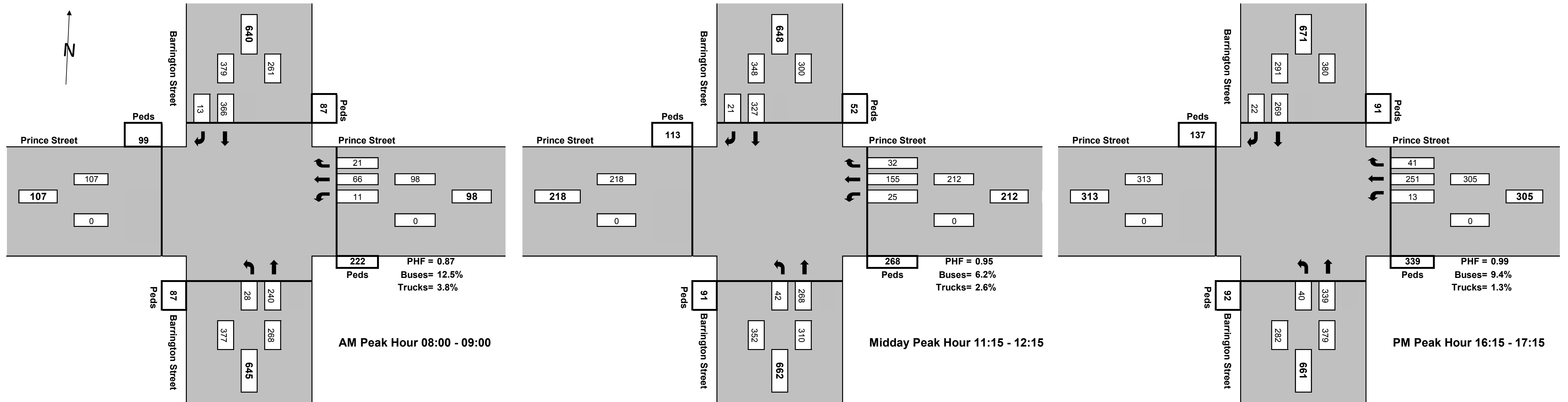


DATE: OCT. 16 2014  
 TIME: 1 HOUR  
 FROM: 5:00:00 PM TO 6:00:00 PM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 913

## Halifax Traffic Count Intersection Volumes - AM, Midday, and PM Weekday Peak Hours

### HRM - Barrington Street at Prince Street



# MANUAL TRAFFIC COUNTS

INTERSECTION:				GEORGE STREET AT HOLLIS STREET								WEATHER		CLOUDY	
												RECORDER		KS	
DAY	DATE	MONTH	YEAR												
WED	6	SEPT	2017												

TIME: 15 MIN INTERVALS		GEORGE STREET FROM THE EAST			GEORGE STREET FROM THE WEST			HOLLIS STREET FROM THE NORTH			HOLLIS STREET FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
07:00:00 AM	07:15:00 AM	0	0	0	0	14	8	5	102	0	0	0	0	129
07:15:00 AM	07:30:00 AM	0	0	0	0	12	9	4	103	0	0	0	0	128
07:30:00 AM	07:45:00 AM	0	0	0	0	11	11	7	132	0	0	0	0	161
07:45:00 AM	08:00:00 AM	0	0	0	0	24	7	8	185	0	0	0	0	224

TOTAL	0	0	0	0	61	35	24	522	0	0	0	0	642
PEAK	0			96			546			0			
15 MIN PEAK	0			124			772			0			
PEAK HOUR FACTOR	0			0.77			0.71			0			
TWO WAY TOTALS	85			96			546			557			FACTOR
													1
													642

DAY	DATE	MONTH	YEAR
WED	6	SEPT	2017

TIME: 15 MIN INTERVALS		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
08:00:00 AM	08:15:00 AM	0	0	0	0	14	10	4	172	0	0	0	0	200
08:15:00 AM	08:30:00 AM	0	0	0	0	18	13	4	216	0	0	0	0	251
08:30:00 AM	08:45:00 AM	0	0	0	0	31	4	5	230	0	0	0	0	270
08:45:00 AM	09:00:00 AM	0	0	0	0	17	5	3	180	0	0	0	0	205

TOTAL	0	0	0	0	80	32	16	798	0	0	0	0	926
PEAK	0			112			814			0			
15 MIN PEAK	0			140			940			0			
PEAK HOUR FACTOR	0			0.8			0.87			0			
TWO WAY TOTALS	96			112			814			830			FACTOR
													1
													926



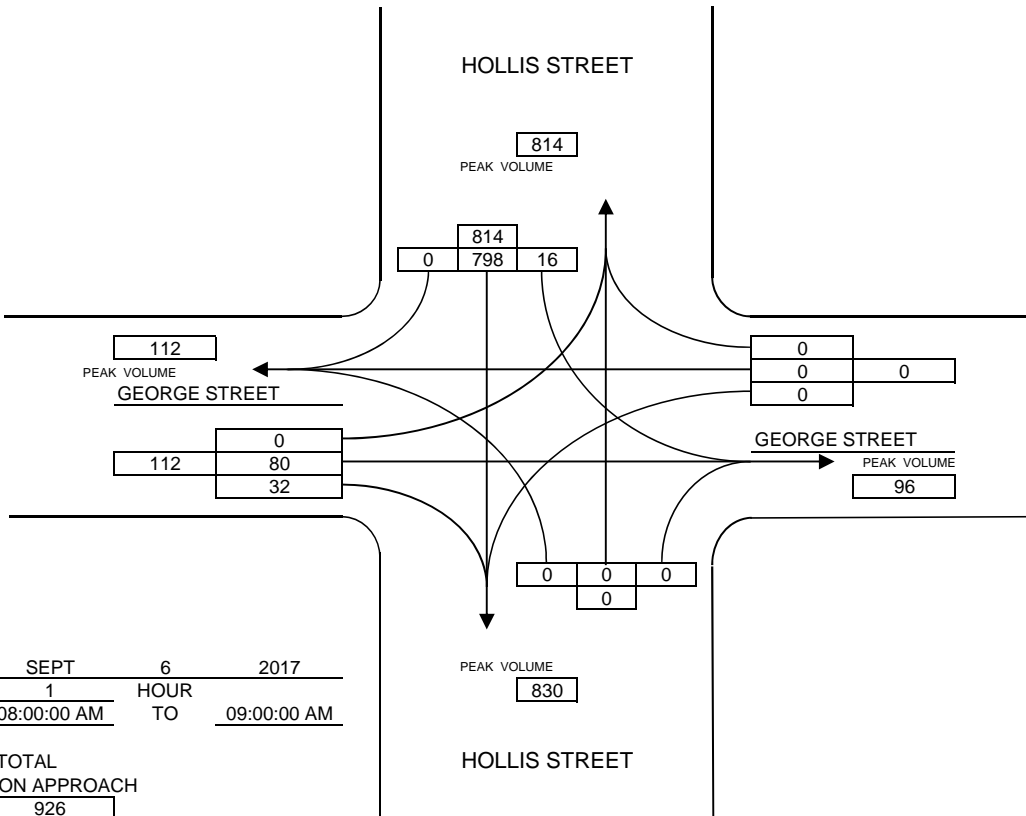
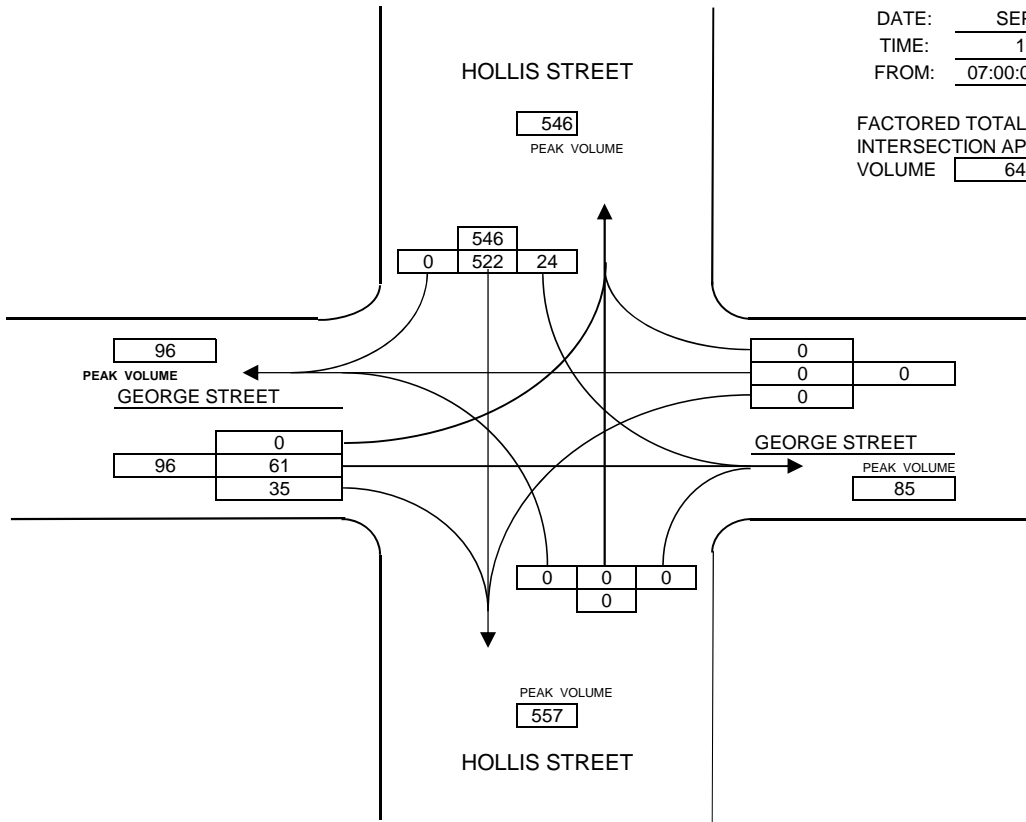
# VEHICULAR GRAPHIC SUMMARY SHEET

## GEORGE STREET AT HOLLIS STREET

INTERSECTION :

DATE: SEPT 6 2017  
 TIME: 1 HOUR  
 FROM: 07:00:00 AM TO 08:00:00 AM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 642



DATE: SEPT 6 2017  
 TIME: 1 HOUR  
 FROM: 08:00:00 AM TO 09:00:00 AM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME 926

## MANUAL TRAFFIC COUNTS

INTERSECTION: GEORGE STREET AT HOLLIS STREET

WEATHER: SUNNY  
 RECORDER: KS

DAY: TUES    DATE: 29    MONTH: AUG    YEAR: 2017

TIME: 15 MIN INTERVALS		GEORGE STREET FROM THE EAST			GEORGE STREET FROM THE WEST			HOLLIS STREET FROM THE NORTH			HOLLIS STREET FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
04:00:00 PM	04:15:00 PM	0	0	0	0	6	9	11	77	0	0	0	0	103
04:15:00 PM	04:30:00 PM	0	0	0	0	2	10	6	113	0	0	0	0	131
04:30:00 PM	04:45:00 PM	0	0	0	0	1	6	6	127	0	0	0	0	140
04:45:00 PM	05:00:00 PM	0	0	0	0	3	5	10	105	0	0	0	0	123

TOTAL	0	0	0	0	12	30	33	422	0	0	0	0	497
PEAK	0			42			455			0			
15 MIN PEAK	0			60			532			0			
PEAK HOUR FACTOR	0			0.7			0.86			0			
TWO WAY TOTALS	45			42			455			452			FACTOR
													1.03
													512

DAY: TUES    DATE: 29    MONTH: AUG    YEAR: 2017

TIME: 15 MIN INTERVALS		FROM THE EAST			FROM THE WEST			FROM THE NORTH			FROM THE SOUTH			TOTAL
		L	S	R	L	S	R	L	S	R	L	S	R	
05:00:00 PM	05:15:00 PM	0	0	0	0	3	8	9	117	0	0	0	0	137
05:15:00 PM	05:30:00 PM	0	0	0	0	0	11	8	127	0	0	0	0	146
05:30:00 PM	05:45:00 PM	0	0	0	0	2	10	4	82	0	0	0	0	98
05:45:00 PM	06:00:00 PM	0	0	0	0	1	7	7	104	0	0	0	0	119

TOTAL	0	0	0	0	6	36	28	430	0	0	0	0	500
PEAK	0			42			458			0			
15 MIN PEAK	0			48			540			0			
PEAK HOUR FACTOR	0			0.88			0.85			0			
TWO WAY TOTALS	34			42			458			466			FACTOR
													1.03
													515

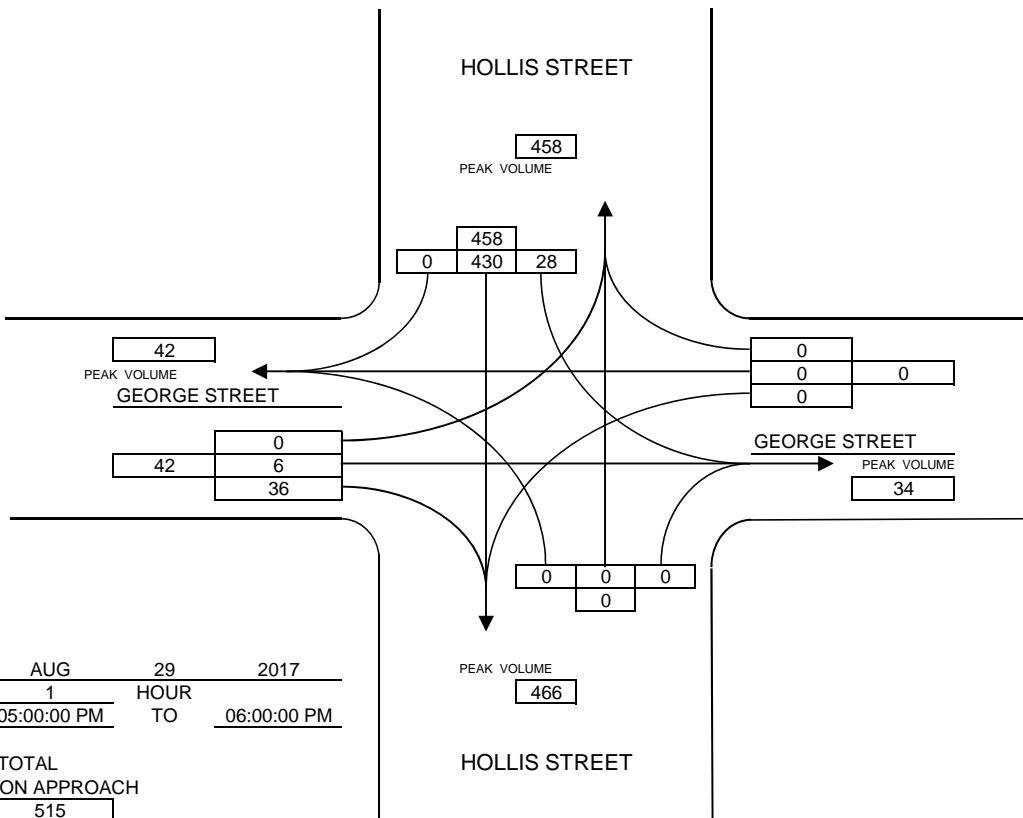
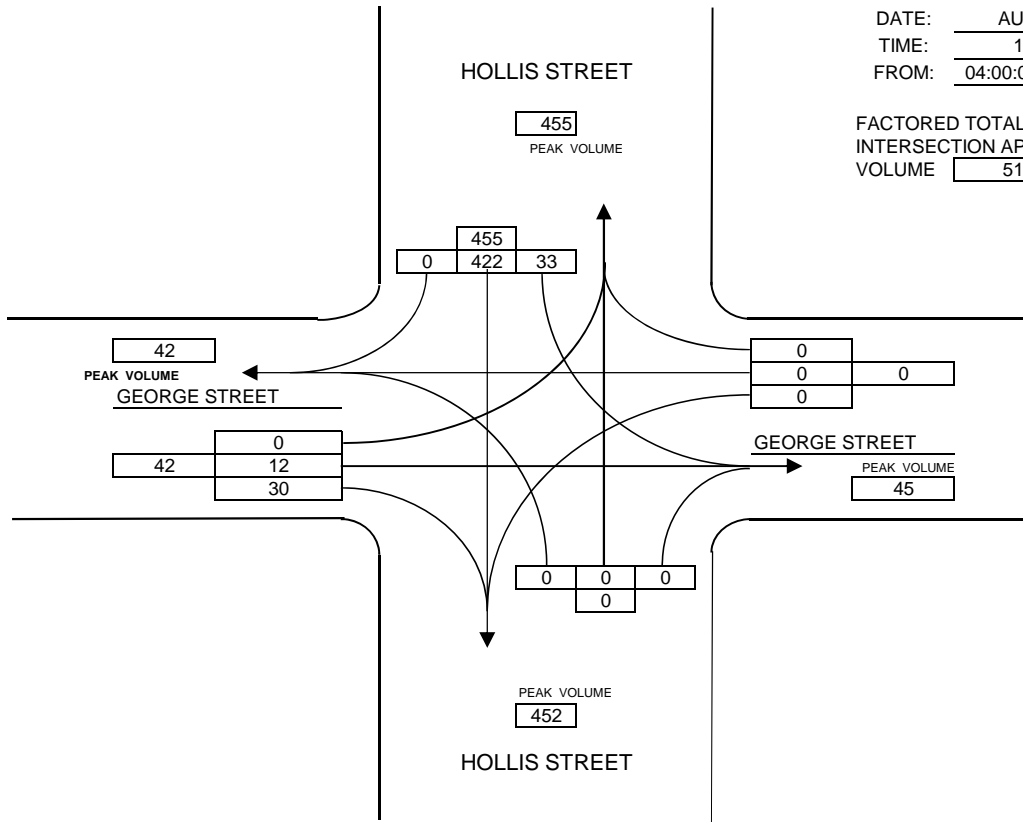
# VEHICULAR GRAPHIC SUMMARY SHEET

## GEORGE STREET AT HOLLIS STREET

INTERSECTION :

DATE:      AUG      29      2017  
 TIME:      1      HOUR  
 FROM:      04:00:00 PM      TO      05:00:00 PM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME      512



DATE:      AUG      29      2017  
 TIME:      1      HOUR  
 FROM:      05:00:00 PM      TO      06:00:00 PM

FACTORED TOTAL  
 INTERSECTION APPROACH  
 VOLUME      515



## PEDESTRIAN STUDY GRAPHIC SUMMARY SHEET

INTERSECTION : GEORGE STREET AT HOLLIS STREET

DATE: SEPT. 6 2017  
 TIME: 1 HOUR  
 FROM: 07:00 AM TO 08:00 AM  
 WEATHER: CLOUDY  
 STREET WIDTH A:  
B:  
 STUDY DONE BY: KS

N



**HOLLIS STREET**  
 (STREET NAME)

ADULT	SENIOR	DISABLED	CHILDREN	CAD
← 33	3	0	0	0
37	0	0	0	0 →

ADULT	21	↑ 25
SENIOR	0	0
DISABLED	0	0
CHILDREN	0	0
CAD	0	0 ↓

**GEORGE STREET**  
 (STREET NAME)

19	↑ 39	ADULT
0	0	SENIOR
0	0	DISABLED
0	0	CHILDREN
0	1	CAD ↓

**GEORGE STREET**  
 (STREET NAME)

ADULT	SENIOR	DISABLED	CHILDREN	CAD
← 17	0	0	0	0
8	0	0	0	0 →

**HOLLIS STREET**  
 (STREET NAME)

## PEDESTRIAN STUDY GRAPHIC SUMMARY SHEET

INTERSECTION : GEORGE STREET AT HOLLIS STREET

DATE: SEPT. 6 2017  
 TIME: 1 HOUR  
 FROM: 08:00 AM TO 09:00 AM  
 WEATHER: CLOUDY/CLEAR  
 STREET WIDTH A:  
B:  
 STUDY DONE BY: KS

N



**HOLLIS STREET**  
(STREET NAME)

ADULT	SENIOR	DISABLED	CHILDREN	CAD
← 23	0	0	0	0
37	0	0	0	0 →

ADULT	18	↑ 31
SENIOR	0	0
DISABLED	0	0
CHILDREN	0	0
CAD	0	0 ↓

**GEORGE STREET**  
(STREET NAME)

28	↑ 36	ADULT
0	0	SENIOR
0	0	DISABLED
0	0	CHILDREN
0	0	CAD ↓

**GEORGE STREET**  
(STREET NAME)

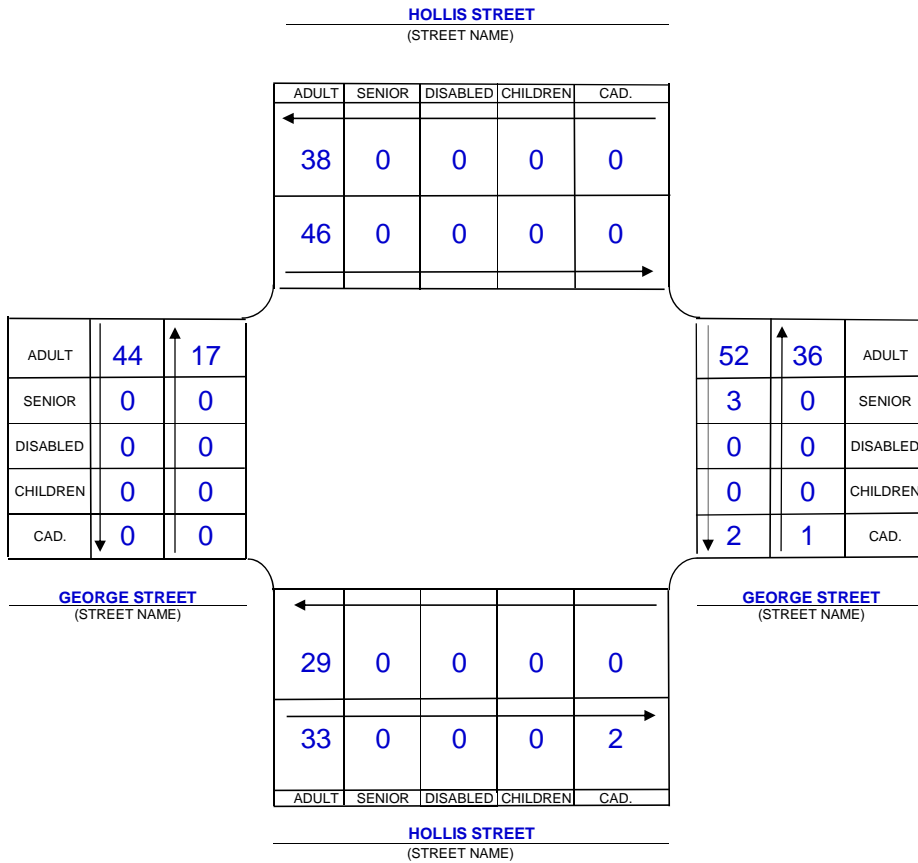
← 15	0	0	0	0
12	0	0	0	0 →
ADULT	SENIOR	DISABLED	CHILDREN	CAD

**HOLLIS STREET**  
(STREET NAME)

## PEDESTRIAN STUDY GRAPHIC SUMMARY SHEET

INTERSECTION : GEORGE STREET AT HOLLIS STREET

DATE: AUG. 29 2017  
 TIME: 1 HOUR  
 FROM: 04:00 PM TO 05:00 PM  
 WEATHER: SUNNY/CLEAR  
 STREET WIDTH A: \_\_\_\_\_  
 B: \_\_\_\_\_  
 STUDY DONE BY: KS



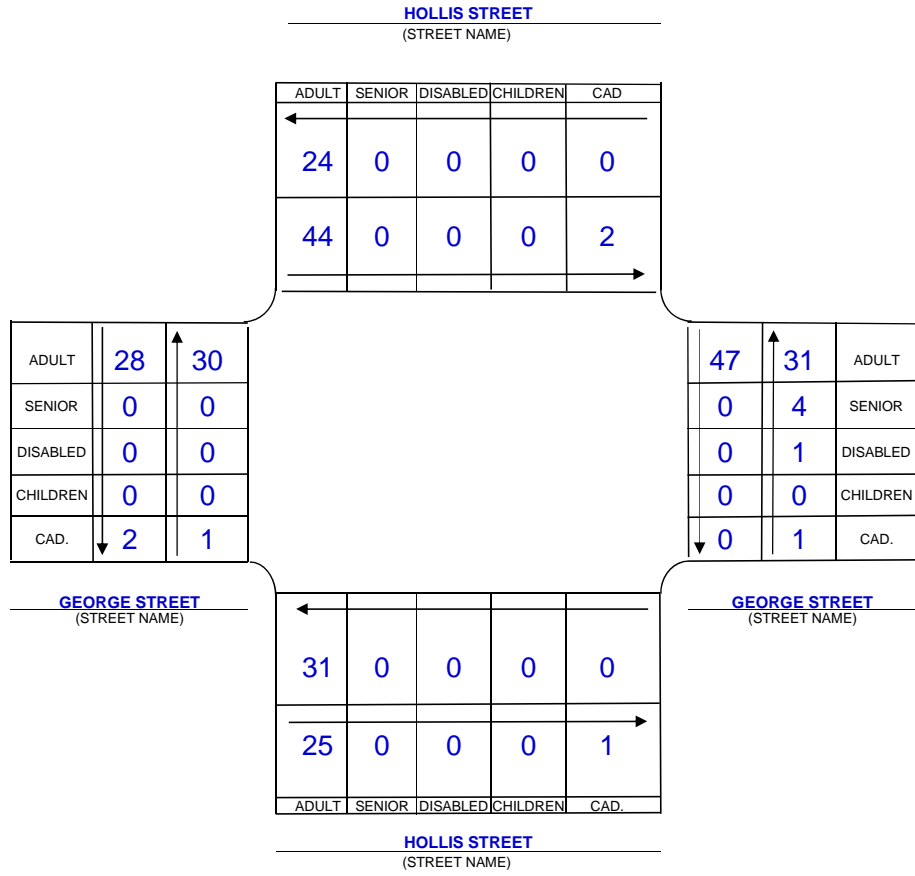
COMMENTS: - CHILDREN – child <12 unaccompanied by an adult (2 EAU)  
 - CAD – child <12 accompanied by an adult (1 EAU)

## PEDESTRIAN STUDY GRAPHIC SUMMARY SHEET

INTERSECTION :                     **GEORGE STREET AT HOLLIS STREET**                    

DATE:   **AUG.**     **29**     **2017**    
 TIME:   **1**   HOUR  
 FROM:   **05:00 PM**   TO   **06:00 PM**    
 WEATHER:   **SUNNY/CLEAR**    
 STREET WIDTH   **A:**    
                     **B:**    
 STUDY DONE BY:                     **KS**                    

**N**



- COMMENTS: - CHILDREN – child <12 unaccompanied by an adult (2 EAU)  
 - CAD – child <12 accompanied by an adult (1 EAU)



# APPENDIX B

## Appendix B: TRIP GENERATION

## Trip Generation Summary

Alternative: Alternative 1

Phase:

Open Date: 12/12/2019

Project: Dennis Building

Analysis Date: 12/12/2019

ITE	Land Use	Weekday Average Daily Trips			Weekday AM Peak Hour of Adjacent Street Traffic			Weekday PM Peak Hour of Adjacent Street Traffic					
		*	Enter	Exit	Total	*	Enter	Exit	Total	*	Enter	Exit	Total
221	Mid-Rise Resid.-Ground Commercial 120 Dwelling Units		327	326	653		11	32	43		32	21	53
Unadjusted Volume			327	326	653		11	32	43		32	21	53
Internal Capture Trips			0	0	0		0	0	0		0	0	0
Pass-By Trips			0	0	0		0	0	0		0	0	0
Volume Added to Adjacent Streets			327	326	653		11	32	43		32	21	53

Total Weekday Average Daily Trips Internal Capture = 0 Percent

Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

\* - Custom rate used for selected time period.

Source: Institute of Transportation Engineers, Trip Generation Manual 10th Edition

**TRIP GENERATION 10, TRAFFICWARE, LLC**

# APPENDIX C

## Appendix C: TRIP ASSIGNMENT

**Development: Dennis Building**

**Driveway: 1      Dennis Driveway**

Origin #	Route	To		From	
		Distribution %	Trips	Distribution %	Trips
1	Dennis Driveway to Duke - West	30.00	3	0.00	---
2	Dennis Driveway to Barrington - North	30.00	3	0.00	---
4	Dennis Driveway to Barrington - South	30.00	3	0.00	---
5	Dennis Driveway to Prince - East	10.00	1	0.00	---
6	Granville - North to Dennis Driveway	0.00	---	30.00	8
7	George - East to Dennis Driveway	0.00	---	35.00	9
8	Hollis - South to Dennis Driveway	0.00	---	35.00	9



**Development: Dennis Building**

**Driveway: 1      Dennis Driveway**









Origin #	Route	To		From	
		Distribution %	Trips	Distribution %	Trips
1	Dennis Driveway to Duke - West	30.00	10	0.00	---
2	Dennis Driveway to Barrington - North	30.00	10	0.00	---
4	Dennis Driveway to Barrington - South	30.00	10	0.00	---
5	Dennis Driveway to Prince - East	10.00	3	0.00	---
6	Granville - North to Dennis Driveway	0.00	---	30.00	6
7	George - East to Dennis Driveway	0.00	---	35.00	7
8	Hollis - South to Dennis Driveway	0.00	---	35.00	7

















# APPENDIX D

Appendix D: SYNCHRO REPORTS



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↩			↩
Traffic Volume (veh/h)	0	0	243	27	79	403
Future Volume (Veh/h)	0	0	243	27	79	403
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	264	29	86	438
Pedestrians	538					
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)	119			117		
pX, platoon unblocked	0.86	0.94			0.94	
vC, conflicting volume	1426	816			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1259	773			789	
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			89	
cM capacity (veh/h)	144	375			773	
Direction, Lane #	NB 1	SB 1				
Volume Total	293	524				
Volume Left	0	86				
Volume Right	29	0				
cSH	1700	773				
Volume to Capacity	0.17	0.11				
Queue Length 95th (m)	0.0	3.0				
Control Delay (s)	0.0	3.0				
Lane LOS			A			
Approach Delay (s)	0.0	3.0				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			1.9			
Intersection Capacity Utilization			52.1%	ICU Level of Service	A	
Analysis Period (min)			15			

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	106	0	0	0	0	0
Future Volume (Veh/h)	106	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	-6%			0%	8%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	115	0	0	0	0	0
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)				80		
pX, platoon unblocked						
vC, conflicting volume			115		115	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			115		115	115
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1474		881	937
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>				
Volume Total	115	0				
Volume Left	0	0				
Volume Right	0	0				
cSH	1700	1700				
Volume to Capacity	0.07	0.00				
Queue Length 95th (m)	0.0	0.0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS		A				
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			9.5%		ICU Level of Service	A
Analysis Period (min)			15			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	76	0	0	0	0	0	30	42	0	0	0
Future Volume (Veh/h)	30	76	0	0	0	0	0	30	42	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		-6%			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)	33	83	0	0	0	0	0	33	46	0	0	0
Pedestrians		200			200			200			200	
Lane Width (m)		4.2			0.0			3.6			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		19			0			17			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					56							
pX, platoon unblocked												
vC, conflicting volume	200			283			549	549	483	612	549	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			283			549	549	483	612	549	400
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			100			100	91	91	100	100	100
cM capacity (veh/h)	1372			1066			257	361	486	293	361	524
Direction, Lane #	EB 1	EB 2	NB 1	NB 2								
Volume Total	33	83	33	46								
Volume Left	33	0	0	0								
Volume Right	0	0	0	46								
cSH	1372	1700	361	486								
Volume to Capacity	0.02	0.05	0.09	0.09								
Queue Length 95th (m)	0.6	0.0	2.4	2.5								
Control Delay (s)	7.7	0.0	16.0	13.2								
Lane LOS	A		C	B								
Approach Delay (s)	2.2		14.3									
Approach LOS			B									
<b>Intersection Summary</b>												
Average Delay			7.1									
Intersection Capacity Utilization			33.3%		ICU Level of Service				A			
Analysis Period (min)			15									





Lane Group	EBT	EBR	WBT	NBT	NBR	SBT	SBR
Lane Configurations	↑	↗	↖	↑	↗	↑	↗
Traffic Volume (vph)	126	62	96	218	11	413	182
Future Volume (vph)	126	62	96	218	11	413	182
Turn Type	NA	Perm	NA	NA	Perm	NA	Perm
Protected Phases	4		8	2		6	
Permitted Phases		4			2		6
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	25.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)	20.5	20.5	20.5	30.5	30.5	30.5	30.5
Actuated g/C Ratio	0.34	0.34	0.34	0.51	0.51	0.51	0.51
v/c Ratio	0.24	0.19	0.26	0.28	0.02	0.53	0.36
Control Delay	15.6	5.7	12.9	8.4	1.5	12.8	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	5.7	12.9	8.4	1.5	12.8	4.7
LOS	B	A	B	A	A	B	A
Approach Delay	12.4		12.9	8.1		10.3	
Approach LOS	B		B	A		B	

Intersection Summary

Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 46.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Barrington & Duke





Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	12	69	22	29	252	385
Future Volume (vph)	12	69	22	29	252	385
Turn Type	Perm	NA	Perm	Perm	NA	NA
Protected Phases		8			2	6
Permitted Phases	8		8	2		
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	24.0	36.0	36.0	36.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Act Effect Green (s)	19.5	19.5	19.5	31.5	31.5	31.5
Actuated g/C Ratio	0.32	0.32	0.32	0.52	0.52	0.52
v/c Ratio	0.04	0.15	0.08	0.10	0.31	0.50
Control Delay	14.4	15.4	6.7	8.2	9.3	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	15.4	6.7	8.2	9.3	11.8
LOS	B	B	A	A	A	B
Approach Delay		13.4			9.2	11.8
Approach LOS		B			A	B

Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.50  
 Intersection Signal Delay: 11.1  
 Intersection Capacity Utilization 49.3%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 5: Prince & Barrington



	→	↘	↓
Lane Group	EBT	EBR	SBT
Lane Configurations	↑	↗	↖↗
Traffic Volume (vph)	82	33	814
Future Volume (vph)	82	33	814
Turn Type	NA	Perm	NA
Protected Phases	4		6
Permitted Phases		4	
Minimum Split (s)	22.5	22.5	22.5
Total Split (s)	25.0	25.0	35.0
Total Split (%)	41.7%	41.7%	58.3%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5
<b>Lead/Lag</b>			
Lead-Lag Optimize?			
Act Effect Green (s)	20.5	20.5	30.5
Actuated g/C Ratio	0.34	0.34	0.51
v/c Ratio	0.14	0.08	0.57
Control Delay	11.3	4.2	11.6
Queue Delay	0.0	0.0	0.0
Total Delay	11.3	4.2	11.6
LOS	B	A	B
Approach Delay	9.3		11.6
Approach LOS	A		B

**Intersection Summary**

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.57  
 Intersection Signal Delay: 11.3  
 Intersection Capacity Utilization 51.3%  
 Analysis Period (min) 15

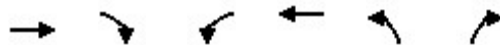
Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 302: Hollis & George





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (veh/h)	0	0	243	27	79	403
Future Volume (Veh/h)	0	0	255	28	83	424
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	277	30	90	461
Pedestrians	538					
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)	119			117		
pX, platoon unblocked	0.85	0.93			0.93	
vC, conflicting volume	1471	830			845	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1288	782			798	
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			88	
cM capacity (veh/h)	135	368			761	
Direction, Lane #	NB 1	SB 1				
Volume Total	307	551				
Volume Left	0	90				
Volume Right	30	0				
cSH	1700	761				
Volume to Capacity	0.18	0.12				
Queue Length 95th (m)	0.0	3.2				
Control Delay (s)	0.0	3.1				
Lane LOS	A					
Approach Delay (s)	0.0	3.1				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			2.0			
Intersection Capacity Utilization			52.1%	ICU Level of Service	A	
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔				↔	
Traffic Volume (veh/h)	106	0	0	0	0	0
Future Volume (Veh/h)	111	0	0	0	0	0
Sign Control	Free			Free Stop		
Grade	-6%			0%	8%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	121	0	0	0	0	0
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	80					
pX, platoon unblocked						
vC, conflicting volume			121		121	121
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		121	121
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1467		874	930
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>				
Volume Total	121	0				
Volume Left	0	0				
Volume Right	0	0				
cSH	1700	1700				
Volume to Capacity	0.07	0.00				
Queue Length 95th (m)	0.0	0.0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS		A				
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			9.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	76	0	0	0	0	0	30	42	0	0	0
Future Volume (Veh/h)	32	80	0	0	0	0	0	32	44	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		-6%			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)	35	87	0	0	0	0	0	35	48	0	0	0
Pedestrians		200			200			200			200	
Lane Width (m)		4.2			0.0			3.6			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		19			0			17			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					56							
pX, platoon unblocked												
vC, conflicting volume	200			287			557	557	487	622	557	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			287			557	557	487	622	557	400
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 %	97			100			100	90	90	100	100	100
cM capacity (veh/h)	1372			1063			253	356	484	285	356	524
Direction, Lane #	EB 1	EB 2	NB 1	NB 2								
Volume Total	35	87	35	48								
Volume Left	35	0	0	0								
Volume Right	0	0	0	48								
cSH	1372	1700	356	484								
Volume to Capacity	0.03	0.05	0.10	0.10								
Queue Length 95th (m)	0.6	0.0	2.6	2.6								
Control Delay (s)	7.7	0.0	16.2	13.3								
Lane LOS	A		C	B								
Approach Delay (s)	2.2		14.5									
Approach LOS			B									
Intersection Summary												
Average Delay			7.2									
Intersection Capacity Utilization			33.3%		ICU Level of Service				A			
Analysis Period (min)			15									





Lane Group	EBT	EBR	WBT	NBT	NBR	SBT	SBR
Lane Configurations	↑	↗	↖	↑	↗	↑	↗
Traffic Volume (vph)	126	62	96	218	11	413	182
Future Volume (vph)	132	65	101	229	12	434	191
Turn Type	NA	Perm	NA	NA	Perm	NA	Perm
Protected Phases	4		8	2		6	
Permitted Phases		4			2		6
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	25.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)	20.5	20.5	20.5	30.5	30.5	30.5	30.5
Actuated g/C Ratio	0.34	0.34	0.34	0.51	0.51	0.51	0.51
v/c Ratio	0.25	0.20	0.28	0.29	0.03	0.55	0.38
Control Delay	15.7	5.7	13.2	8.7	2.1	13.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	5.7	13.2	8.7	2.1	13.2	5.2
LOS	B	A	B	A	A	B	A
Approach Delay	12.4		13.2	8.4		10.8	
Approach LOS	B		B	A		B	

Intersection Summary

Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 46.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Barrington & Duke





Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	12	69	22	29	252	385
Future Volume (vph)	13	73	23	30	265	405
Turn Type	Perm	NA	Perm	Perm	NA	NA
Protected Phases		8			2	6
Permitted Phases	8		8	2		
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	24.0	36.0	36.0	36.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Act Effect Green (s)	19.5	19.5	19.5	31.5	31.5	31.5
Actuated g/C Ratio	0.32	0.32	0.32	0.52	0.52	0.52
v/c Ratio	0.04	0.16	0.08	0.11	0.33	0.53
Control Delay	14.5	15.5	6.9	8.3	9.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	15.5	6.9	8.3	9.5	12.5
LOS	B	B	A	A	A	B
Approach Delay		13.5			9.4	12.5
Approach LOS		B			A	B

Intersection Summary

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.53  
 Intersection Signal Delay: 11.5  
 Intersection Capacity Utilization 49.3%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 5: Prince & Barrington



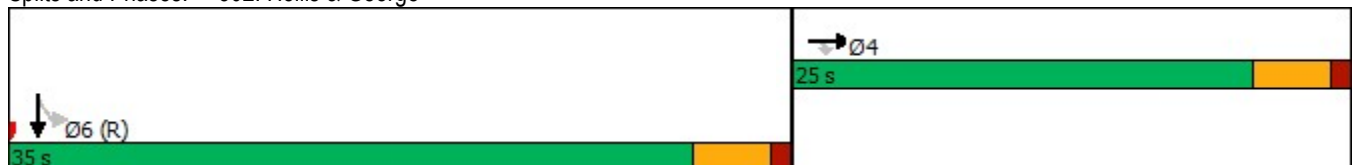
	→	↘	↓
Lane Group	EBT	EBR	SBT
Lane Configurations	↑	↗	↖↗
Traffic Volume (vph)	82	33	814
Future Volume (vph)	86	35	856
Turn Type	NA	Perm	NA
Protected Phases	4		6
Permitted Phases		4	
Minimum Split (s)	22.5	22.5	22.5
Total Split (s)	25.0	25.0	35.0
Total Split (%)	41.7%	41.7%	58.3%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5
<b>Lead/Lag</b>			
Lead-Lag Optimize?			
Act Effect Green (s)	20.5	20.5	30.5
Actuated g/C Ratio	0.34	0.34	0.51
v/c Ratio	0.15	0.08	0.60
Control Delay	11.3	4.6	12.0
Queue Delay	0.0	0.0	0.0
Total Delay	11.3	4.6	12.0
LOS	B	A	B
Approach Delay	9.3		12.0
Approach LOS	A		B

**Intersection Summary**

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.60  
 Intersection Signal Delay: 11.7  
 Intersection Capacity Utilization 51.3%  
 Analysis Period (min) 15









Intersection LOS: B  
 ICU Level of Service A

















Splits and Phases: 302: Hollis & George





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↩			↩
Traffic Volume (veh/h)	0	0	243	27	79	403
Future Volume (Veh/h)	0	0	255	33	89	424
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	277	36	97	461
Pedestrians	538					
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)			119			117
pX, platoon unblocked	0.85	0.93			0.93	
vC, conflicting volume	1488	833			851	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1301	783			802	
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			87	
cM capacity (veh/h)	131	366			756	
Direction, Lane #	NB 1	SB 1				
Volume Total	313	558				
Volume Left	0	97				
Volume Right	36	0				
cSH	1700	756				
Volume to Capacity	0.18	0.13				
Queue Length 95th (m)	0.0	3.5				
Control Delay (s)	0.0	3.3				
Lane LOS		A				
Approach Delay (s)	0.0	3.3				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			2.1			
Intersection Capacity Utilization			52.1%		ICU Level of Service	A
Analysis Period (min)			15			

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	106	0	0	0	0	0
Future Volume (Veh/h)	111	11	0	0	0	34
Sign Control	Free			Free Stop		
Grade	-6%			0%		8%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	121	12	0	0	0	37
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	80					
pX, platoon unblocked						
vC, conflicting volume			133		127	127
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			133		127	127
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			1452		867	923
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>				
Volume Total	133	37				
Volume Left	0	0				
Volume Right	12	37				
cSH	1700	923				
Volume to Capacity	0.08	0.04				
Queue Length 95th (m)	0.0	1.0				
Control Delay (s)	0.0	9.1				
Lane LOS		A				
Approach Delay (s)	0.0	9.1				
Approach LOS		A				
<b>Intersection Summary</b>						
Average Delay			2.0			
Intersection Capacity Utilization			9.5%	ICU Level of Service	A	
Analysis Period (min)			15			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	76	0	0	0	0	0	30	42	0	0	0
Future Volume (Veh/h)	42	103	0	0	0	0	0	32	44	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		-6%			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)	46	112	0	0	0	0	0	35	48	0	0	0
Pedestrians		200			200			200			200	
Lane Width (m)		4.2			0.0			3.6			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		19			0			17			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					56							
pX, platoon unblocked												
vC, conflicting volume	200			312			604	604	512	670	604	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			312			604	604	512	670	604	400
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 %	97			100			100	89	90	100	100	100
cM capacity (veh/h)	1372			1040			234	332	468	261	332	524
Direction, Lane #	EB 1	EB 2	NB 1	NB 2								
Volume Total	46	112	35	48								
Volume Left	46	0	0	0								
Volume Right	0	0	0	48								
cSH	1372	1700	332	468								
Volume to Capacity	0.03	0.07	0.11	0.10								
Queue Length 95th (m)	0.8	0.0	2.8	2.7								
Control Delay (s)	7.7	0.0	17.1	13.6								
Lane LOS	A		C	B								
Approach Delay (s)	2.2		15.1									
Approach LOS			C									
Intersection Summary												
Average Delay			6.7									
Intersection Capacity Utilization			33.3%		ICU Level of Service				A			
Analysis Period (min)			15									





Lane Group	EBT	EBR	WBT	NBT	NBR	SBT	SBR
Lane Configurations	↑	↗	↖	↑	↗	↑	↗
Traffic Volume (vph)	126	62	96	218	11	413	182
Future Volume (vph)	132	68	101	229	12	437	191
Turn Type	NA	Perm	NA	NA	Perm	NA	Perm
Protected Phases	4		8	2		6	
Permitted Phases		4			2		6
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	25.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag							
Lead-Lag Optimize?							
Act Effect Green (s)	20.5	20.5	20.5	30.5	30.5	30.5	30.5
Actuated g/C Ratio	0.34	0.34	0.34	0.51	0.51	0.51	0.51
v/c Ratio	0.25	0.20	0.28	0.29	0.03	0.56	0.38
Control Delay	15.7	5.7	13.2	8.8	2.2	13.3	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	5.7	13.2	8.8	2.2	13.3	5.2
LOS	B	A	B	A	A	B	A
Approach Delay	12.3		13.2	8.4		10.8	
Approach LOS	B		B	A		B	

Intersection Summary

Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 46.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Barrington & Duke





Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations	↖	↑	↗	↖	↑	↗
Traffic Volume (vph)	12	69	22	29	252	385
Future Volume (vph)	13	73	24	30	268	405
Turn Type	Perm	NA	Perm	Perm	NA	NA
Protected Phases		8			2	6
Permitted Phases	8		8	2		
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	24.0	24.0	24.0	36.0	36.0	36.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Act Effect Green (s)	19.5	19.5	19.5	31.5	31.5	31.5
Actuated g/C Ratio	0.32	0.32	0.32	0.52	0.52	0.52
v/c Ratio	0.04	0.16	0.09	0.11	0.33	0.53
Control Delay	14.5	15.5	7.0	8.3	9.5	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	15.5	7.0	8.3	9.5	12.6
LOS	B	B	A	A	A	B
Approach Delay		13.5			9.4	12.6
Approach LOS		B			A	B

Intersection Summary

Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 49.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Prince & Barrington



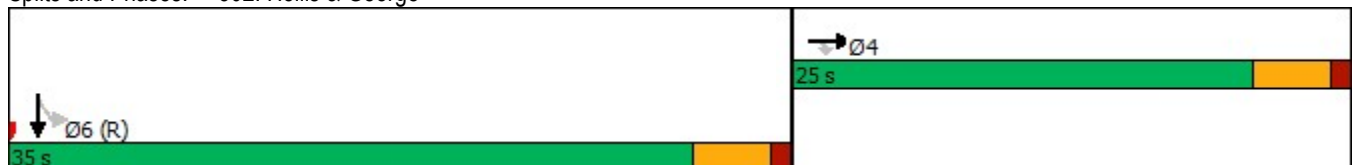
	→	↘	↓
Lane Group	EBT	EBR	SBT
Lane Configurations	↑	↗	↖↗
Traffic Volume (vph)	82	33	814
Future Volume (vph)	98	46	856
Turn Type	NA	Perm	NA
Protected Phases	4		6
Permitted Phases		4	
Minimum Split (s)	22.5	22.5	22.5
Total Split (s)	25.0	25.0	35.0
Total Split (%)	41.7%	41.7%	58.3%
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5
Lead/Lag			
Lead-Lag Optimize?			
Act Effect Green (s)	20.5	20.5	30.5
Actuated g/C Ratio	0.34	0.34	0.51
v/c Ratio	0.17	0.11	0.60
Control Delay	12.1	5.9	12.0
Queue Delay	0.0	0.0	0.0
Total Delay	12.1	5.9	12.0
LOS	B	A	B
Approach Delay	10.1		12.0
Approach LOS	B		B

**Intersection Summary**

Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.60  
 Intersection Signal Delay: 11.8  
 Intersection Capacity Utilization 51.3%  
 Analysis Period (min) 15









Intersection LOS: B  
 ICU Level of Service A

















Splits and Phases: 302: Hollis & George





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (veh/h)	0	0	376	21	61	331
Future Volume (Veh/h)	0	0	376	21	61	331
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	409	23	66	360
Pedestrians	538					
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)			119			117
pX, platoon unblocked	0.93	0.87			0.87	
vC, conflicting volume	1450	958			970	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1142	874			888	
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)	185	302			653	
Direction, Lane #	NB 1	SB 1				
Volume Total	432	426				
Volume Left	0	66				
Volume Right	23	0				
cSH	1700	653				
Volume to Capacity	0.25	0.10				
Queue Length 95th (m)	0.0	2.7				
Control Delay (s)	0.0	2.9				
Lane LOS		A				
Approach Delay (s)	0.0	2.9				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			53.7%		ICU Level of Service	A
Analysis Period (min)			15			

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	82	0	0	0	0	0
Future Volume (Veh/h)	82	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	-6%			0%	8%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	0	0	0	0	0
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)				80		
pX, platoon unblocked						
vC, conflicting volume			89		89	89
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			89		89	89
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1506		911	969
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>				
Volume Total	89	0				
Volume Left	0	0				
Volume Right	0	0				
cSH	1700	1700				
Volume to Capacity	0.05	0.04				
Queue Length 95th (m)	0.0	0.0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS		A				
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			8.1%		ICU Level of Service	A
Analysis Period (min)			15			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	37	0	0	0	0	0	40	7	0	0	0
Future Volume (Veh/h)	45	37	0	0	0	0	0	40	7	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		-6%			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)	49	40	0	0	0	0	0	43	8	0	0	0
Pedestrians		200			200			200			200	
Lane Width (m)		4.2			0.0			3.6			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		19			0			17			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					56							
pX, platoon unblocked												
vC, conflicting volume	200			240			538	538	440	568	538	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			240			538	538	440	568	538	400
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 %	96			100			100	88	98	100	100	100
cM capacity (veh/h)	1372			1106			259	361	514	331	361	524
Direction, Lane #	EB 1	EB 2	NB 1	NB 2								
Volume Total	49	40	43	8								
Volume Left	49	0	0	0								
Volume Right	0	0	0	8								
cSH	1372	1700	361	514								
Volume to Capacity	0.04	0.02	0.12	0.02								
Queue Length 95th (m)	0.9	0.0	3.2	0.4								
Control Delay (s)	7.7	0.0	16.3	12.1								
Lane LOS	A		C	B								
Approach Delay (s)	4.3		15.6									
Approach LOS			C									
Intersection Summary												
Average Delay			8.4									
Intersection Capacity Utilization			33.3%		ICU Level of Service				A			
Analysis Period (min)			15									



Dennis Building TIS  
4: Barrington & Duke

2019 - Baseline  
PM Peak

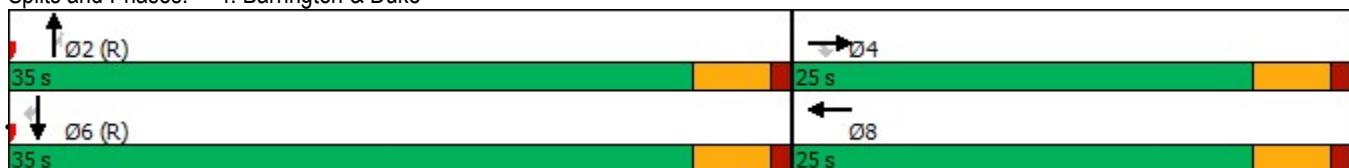


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖			↑	↗		↑	↗
Traffic Volume (vph)	0	78	45	0	199	39	0	348	7	0	346	183
Future Volume (vph)	0	78	45	0	199	39	0	348	7	0	346	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		20.0	0.0		0.0
Storage Lanes	0		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		41			41			41			41	
Link Distance (m)		59.9			50.4			116.9			43.5	
Travel Time (s)		5.3			4.4			10.3			3.8	
Turn Type		NA	Perm		NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases			4						2			6
Minimum Split (s)		22.5	22.5		22.5			22.5	22.5		22.5	22.5
Total Split (s)		25.0	25.0		25.0			35.0	35.0		35.0	35.0
Total Split (%)		41.7%	41.7%		41.7%			58.3%	58.3%		58.3%	58.3%
Yellow Time (s)		3.5	3.5		3.5			3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0			1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5			4.5	4.5		4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		20.5	20.5		20.5			30.5	30.5		30.5	30.5
Actuated g/C Ratio		0.34	0.34		0.34			0.51	0.51		0.51	0.51
v/c Ratio		0.15	0.14		0.48			0.44	0.02		0.44	0.38
Control Delay		14.6	6.0		18.0			11.2	3.3		11.4	7.1
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		14.6	6.0		18.0			11.2	3.3		11.4	7.1
LOS		B	A		B			B	A		B	A
Approach Delay		11.5			18.0			11.0			9.9	
Approach LOS		B			B			B			A	

Intersection Summary

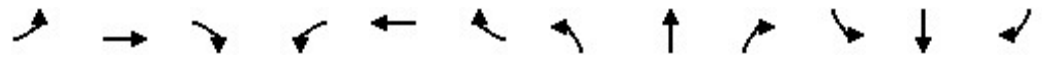
Area Type: CBD  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.48  
 Intersection Signal Delay: 11.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 43.4%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 4: Barrington & Duke



Dennis Building TIS  
5: Prince & Barrington

2019 - Baseline  
PM Peak



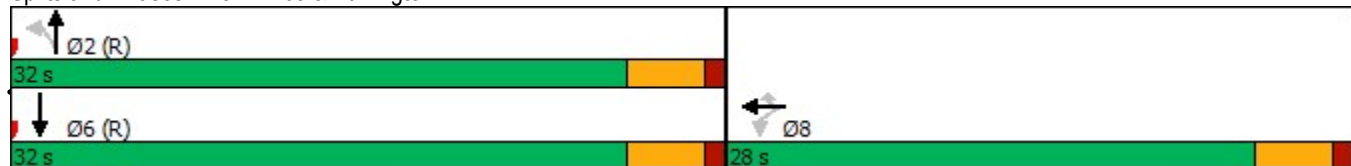
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↘	↗	↖	↑			↘	↙
Traffic Volume (vph)	0	0	0	14	245	59	41	336	0	0	274	28
Future Volume (vph)	0	0	0	14	245	59	41	336	0	0	274	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.0	3.0	3.0	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	0.0		0.0	15.0		15.0	0.0		15.0	0.0		0.0
Storage Lanes	0		0	1		1	1		1	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		41			41			41				41
Link Distance (m)		41.0			54.5			49.3				119.6
Travel Time (s)		3.6			4.8			4.3				10.5
Turn Type				Perm	NA	Perm	Perm	NA				NA
Protected Phases					8			2				6
Permitted Phases				8		8	2					
Minimum Split (s)				22.5	22.5	22.5	22.5	22.5				22.5
Total Split (s)				28.0	28.0	28.0	32.0	32.0				32.0
Total Split (%)				46.7%	46.7%	46.7%	53.3%	53.3%				53.3%
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5				3.5
All-Red Time (s)				1.0	1.0	1.0	1.0	1.0				1.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0				0.0
Total Lost Time (s)				4.5	4.5	4.5	4.5	4.5				4.5
Lead/Lag												
Lead-Lag Optimize?												
Act Effect Green (s)				23.5	23.5	23.5	27.5	27.5				27.5
Actuated g/C Ratio				0.39	0.39	0.39	0.46	0.46				0.46
v/c Ratio				0.04	0.43	0.17	0.14	0.48				0.44
Control Delay				11.8	16.2	5.0	11.0	13.9				15.9
Queue Delay				0.0	0.0	0.0	0.0	0.0				0.0
Total Delay				11.8	16.2	5.0	11.0	13.9				15.9
LOS				B	B	A	B	B				B
Approach Delay					13.9			13.5				15.9
Approach LOS					B			B				B

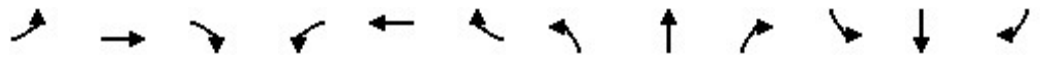
Intersection Summary

Area Type: CBD  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.48  
 Intersection Signal Delay: 14.4  
 Intersection Capacity Utilization 49.0%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 5: Prince & Barrington





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗								↖	↑
Traffic Volume (vph)	0	6	38	0	0	0	0	0	0	29	452	0
Future Volume (vph)	0	6	38	0	0	0	0	0	0	29	452	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	4.0	4.0	4.8	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		-6%			0%			0%			0%	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (k/h)		41			41			41			41	
Link Distance (m)		56.0			43.2			66.6			55.9	
Travel Time (s)		4.9			3.8			5.8			4.9	
Turn Type		NA	Perm							Perm	NA	
Protected Phases		4									6	
Permitted Phases			4							6		
Minimum Split (s)		22.5	22.5							22.5	22.5	
Total Split (s)		26.0	26.0							34.0	34.0	
Total Split (%)		43.3%	43.3%							56.7%	56.7%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.0	1.0							1.0	1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		4.5	4.5								4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		21.5	21.5								29.5	
Actuated g/C Ratio		0.36	0.36								0.49	
v/c Ratio		0.01	0.08								0.35	
Control Delay		8.2	4.1								9.6	
Queue Delay		0.0	0.0								0.0	
Total Delay		8.2	4.1								9.6	
LOS		A	A								A	
Approach Delay		4.7									9.6	
Approach LOS		A									A	

Intersection Summary

Area Type:	CBD
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.35
Intersection Signal Delay:	9.2
Intersection LOS:	A
Intersection Capacity Utilization:	40.6%
ICU Level of Service:	A
Analysis Period (min):	15









Splits and Phases: 302: Hollis & George



















Lanes, Volumes, Timings



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (veh/h)	0	0	376	21	61	331
Future Volume (Veh/h)	0	0	395	22	64	348
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	429	24	70	378
Pedestrians	538					
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)			119			117
pX, platoon unblocked	0.92	0.85			0.85	
vC, conflicting volume	1497	979			991	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1161	890			904	
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			89	
cM capacity (veh/h)	177	292			635	
Direction, Lane #	NB 1	SB 1				
Volume Total	453	448				
Volume Left	0	70				
Volume Right	24	0				
cSH	1700	635				
Volume to Capacity	0.27	0.11				
Queue Length 95th (m)	0.0	3.0				
Control Delay (s)	0.0	3.1				
Lane LOS		A				
Approach Delay (s)	0.0	3.1				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			1.6			
Intersection Capacity Utilization			53.7%		ICU Level of Service	A
Analysis Period (min)			15			

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	82	0	0	0	0	0
Future Volume (Veh/h)	86	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	-6%			0%	8%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	0	0	0	0	0
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)				80		
pX, platoon unblocked						
vC, conflicting volume			93		93	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			93		93	93
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1501		907	964
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>				
Volume Total	93	0				
Volume Left	0	0				
Volume Right	0	0				
cSH	1700	1700				
Volume to Capacity	0.05	0.04				
Queue Length 95th (m)	0.0	0.0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS		A				
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			8.1%	ICU Level of Service		A
Analysis Period (min)			15			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	37	0	0	0	0	0	40	7	0	0	0
Future Volume (Veh/h)	47	39	0	0	0	0	0	42	7	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		-6%			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)	51	42	0	0	0	0	0	46	8	0	0	0
Pedestrians		200			200			200			200	
Lane Width (m)		4.2			0.0			3.6			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		19			0			17			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					56							
pX, platoon unblocked												
vC, conflicting volume	200			242			544	544	442	575	544	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			242			544	544	442	575	544	400
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 %	96			100			100	87	98	100	100	100
cM capacity (veh/h)	1372			1104			256	358	513	324	358	524
Direction, Lane #	EB 1	EB 2	NB 1	NB 2								
Volume Total	51	42	46	8								
Volume Left	51	0	0	0								
Volume Right	0	0	0	8								
cSH	1372	1700	358	513								
Volume to Capacity	0.04	0.02	0.13	0.02								
Queue Length 95th (m)	0.9	0.0	3.5	0.4								
Control Delay (s)	7.7	0.0	16.5	12.1								
Lane LOS	A		C	B								
Approach Delay (s)	4.2		15.9									
Approach LOS			C									
Intersection Summary												
Average Delay			8.5									
Intersection Capacity Utilization			33.3%		ICU Level of Service				A			
Analysis Period (min)			15									

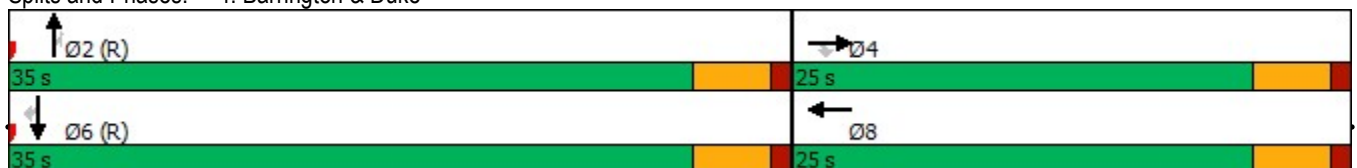


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	78	45	0	199	39	0	348	7	0	346	183
Future Volume (vph)	0	82	47	0	209	41	0	366	7	0	364	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		20.0	0.0		0.0
Storage Lanes	0		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		41			41			41			41	
Link Distance (m)		59.9			50.4			116.9			43.5	
Travel Time (s)		5.3			4.4			10.3			3.8	
Turn Type		NA	Perm		NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases			4						2			6
Minimum Split (s)		22.5	22.5		22.5			22.5	22.5		22.5	22.5
Total Split (s)		25.0	25.0		25.0			35.0	35.0		35.0	35.0
Total Split (%)		41.7%	41.7%		41.7%			58.3%	58.3%		58.3%	58.3%
Yellow Time (s)		3.5	3.5		3.5			3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0			1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5			4.5	4.5		4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		20.5	20.5		20.5			30.5	30.5		30.5	30.5
Actuated g/C Ratio		0.34	0.34		0.34			0.51	0.51		0.51	0.51
v/c Ratio		0.16	0.15		0.50			0.47	0.02		0.47	0.40
Control Delay		14.7	5.9		18.6			11.8	3.6		11.8	7.7
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		14.7	5.9		18.6			11.8	3.6		11.8	7.7
LOS		B	A		B			B	A		B	A
Approach Delay		11.5			18.6			11.6			10.4	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type: CBD  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.50  
 Intersection Signal Delay: 12.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 43.4%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 4: Barrington & Duke



Dennis Building TIS  
5: Prince & Barrington

2024 - Background Traffic  
PM Peak

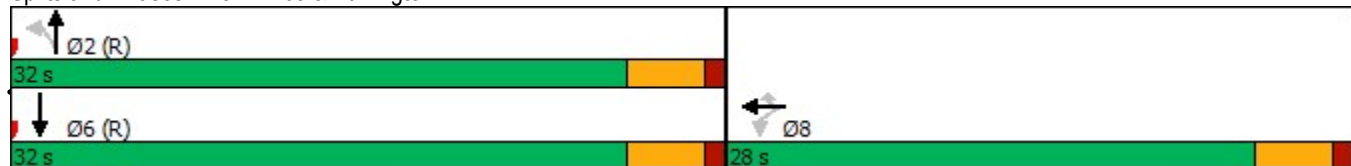


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶	↷	↶	↶	↷			↷	
Traffic Volume (vph)	0	0	0	14	245	59	41	336	0	0	274	28
Future Volume (vph)	0	0	0	15	257	62	43	353	0	0	288	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.0	3.0	3.0	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	0.0		0.0	15.0		15.0	0.0		15.0	0.0		0.0
Storage Lanes	0		0	1		1	1		1	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		41			41			41			41	
Link Distance (m)		41.0			54.5			49.3			119.6	
Travel Time (s)		3.6			4.8			4.3			10.5	
Turn Type				Perm	NA	Perm	Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Minimum Split (s)				22.5	22.5	22.5	22.5	22.5			22.5	
Total Split (s)				28.0	28.0	28.0	32.0	32.0			32.0	
Total Split (%)				46.7%	46.7%	46.7%	53.3%	53.3%			53.3%	
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)				1.0	1.0	1.0	1.0	1.0			1.0	
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)				4.5	4.5	4.5	4.5	4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effect Green (s)				23.5	23.5	23.5	27.5	27.5			27.5	
Actuated g/C Ratio				0.39	0.39	0.39	0.46	0.46			0.46	
v/c Ratio				0.04	0.46	0.18	0.16	0.50			0.47	
Control Delay				11.8	16.5	5.0	11.2	14.3			16.6	
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay				11.8	16.5	5.0	11.2	14.3			16.6	
LOS				B	B	A	B	B			B	
Approach Delay					14.2			13.9			16.6	
Approach LOS					B			B			B	

Intersection Summary

Area Type: CBD  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.50  
 Intersection Signal Delay: 14.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 49.0%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 5: Prince & Barrington

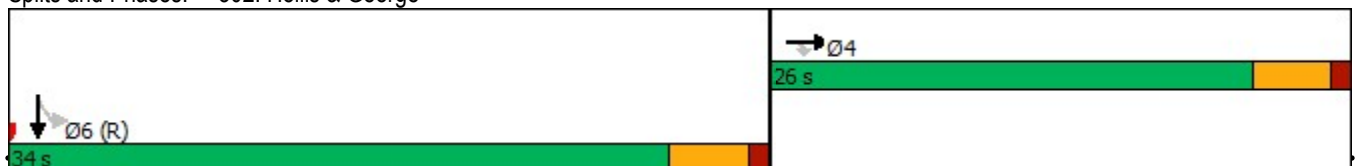


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	6	38	0	0	0	0	0	0	29	452	0
Future Volume (vph)	0	6	40	0	0	0	0	0	0	30	475	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	4.0	4.0	4.8	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		-6%			0%			0%			0%	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (k/h)		41			41			41			41	
Link Distance (m)		56.0			43.2			66.6			55.9	
Travel Time (s)		4.9			3.8			5.8			4.9	
Turn Type		NA	Perm							Perm	NA	
Protected Phases		4									6	
Permitted Phases			4							6		
Minimum Split (s)		22.5	22.5							22.5	22.5	
Total Split (s)		26.0	26.0							34.0	34.0	
Total Split (%)		43.3%	43.3%							56.7%	56.7%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.0	1.0							1.0	1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		4.5	4.5								4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		21.5	21.5								29.5	
Actuated g/C Ratio		0.36	0.36								0.49	
v/c Ratio		0.01	0.09								0.36	
Control Delay		8.0	4.0								9.8	
Queue Delay		0.0	0.0								0.0	
Total Delay		8.0	4.0								9.8	
LOS		A	A								A	
Approach Delay		4.6									9.8	
Approach LOS		A									A	

Intersection Summary

Area Type:	CBD
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.36
Intersection Signal Delay:	9.3
Intersection LOS:	A
Intersection Capacity Utilization:	40.6%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 302: Hollis & George



















Lanes, Volumes, Timings

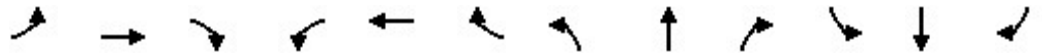


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↩			↩
Traffic Volume (veh/h)	0	0	376	21	61	331
Future Volume (Veh/h)	0	0	395	36	85	348
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	429	39	92	378
Pedestrians	538					
Lane 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)			119			117
pX, platoon unblocked	0.92	0.85			0.85	
vC, conflicting volume	1548	986			1006	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1199	893			916	
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			85	
cM capacity (veh/h)	160	288			623	
Direction, Lane #	NB 1	SB 1				
Volume Total	468	470				
Volume Left	0	92				
Volume Right	39	0				
cSH	1700	623				
Volume to Capacity	0.28	0.15				
Queue Length 95th (m)	0.0	4.1				
Control Delay (s)	0.0	4.1				
Lane LOS		A				
Approach Delay (s)	0.0	4.1				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			2.1			
Intersection Capacity Utilization			53.7%		ICU Level of Service	A
Analysis Period (min)			15			

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗				↘	
Traffic Volume (veh/h)	82	0	0	0	0	0
Future Volume (Veh/h)	86	35	0	0	0	21
Sign Control	Free			Free Stop		
Grade	-6%			0%		8%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	38	0	0	0	23
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	80					
pX, platoon unblocked						
vC, conflicting volume			131		112	112
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			131		112	112
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			1454		884	941
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>				
Volume Total	131	23				
Volume Left	0	0				
Volume Right	38	23				
cSH	1700	941				
Volume to Capacity	0.08	0.02				
Queue Length 95th (m)	0.0	0.6				
Control Delay (s)	0.0	8.9				
Lane LOS		A				
Approach Delay (s)	0.0	8.9				
Approach LOS		A				
<b>Intersection Summary</b>						
Average Delay			1.3			
Intersection Capacity Utilization			8.1%	ICU Level of Service	A	
Analysis Period (min)			15			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	37	0	0	0	0	0	40	7	0	0	0
Future Volume (Veh/h)	54	54	0	0	0	0	0	42	7	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		-6%			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)	59	59	0	0	0	0	0	46	8	0	0	0
Pedestrians		200			200			200			200	
Lane Width (m)		4.2			0.0			3.6			0.0	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		19			0			17			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					56							
pX, platoon unblocked												
vC, conflicting volume	200			259			577	577	459	608	577	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200			259			577	577	459	608	577	400
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 %	96			100			100	87	98	100	100	100
cM capacity (veh/h)	1372			1088			242	341	502	305	341	524
Direction, Lane #	EB 1	EB 2	NB 1	NB 2								
Volume Total	59	59	46	8								
Volume Left	59	0	0	0								
Volume Right	0	0	0	8								
cSH	1372	1700	341	502								
Volume to Capacity	0.04	0.03	0.13	0.02								
Queue Length 95th (m)	1.1	0.0	3.7	0.4								
Control Delay (s)	7.7	0.0	17.2	12.3								
Lane LOS	A		C	B								
Approach Delay (s)	3.9		16.5									
Approach LOS			C									
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			33.3%		ICU Level of Service				A			
Analysis Period (min)			15									



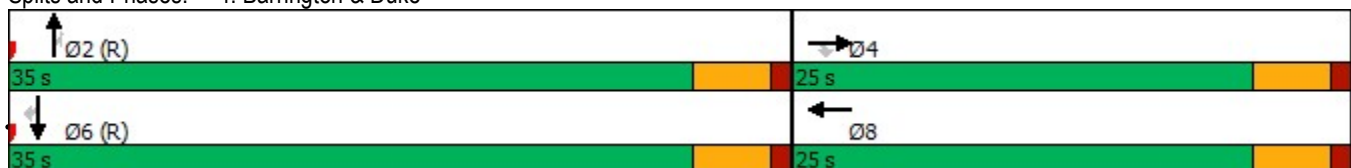


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖			↑	↗		↑	↗
Traffic Volume (vph)	0	78	45	0	199	39	0	348	7	0	346	183
Future Volume (vph)	0	82	58	0	209	41	0	366	7	0	374	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		20.0	0.0		0.0
Storage Lanes	0		1	0		0	0		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		41			41			41			41	
Link Distance (m)		59.9			50.4			116.9			43.5	
Travel Time (s)		5.3			4.4			10.3			3.8	
Turn Type		NA	Perm		NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases			4						2			6
Minimum Split (s)		22.5	22.5		22.5			22.5	22.5		22.5	22.5
Total Split (s)		25.0	25.0		25.0			35.0	35.0		35.0	35.0
Total Split (%)		41.7%	41.7%		41.7%			58.3%	58.3%		58.3%	58.3%
Yellow Time (s)		3.5	3.5		3.5			3.5	3.5		3.5	3.5
All-Red Time (s)		1.0	1.0		1.0			1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5	4.5		4.5			4.5	4.5		4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		20.5	20.5		20.5			30.5	30.5		30.5	30.5
Actuated g/C Ratio		0.34	0.34		0.34			0.51	0.51		0.51	0.51
v/c Ratio		0.16	0.18		0.50			0.47	0.02		0.48	0.40
Control Delay		14.7	5.8		18.6			12.1	3.7		12.0	7.7
Queue Delay		0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay		14.7	5.8		18.6			12.1	3.7		12.0	7.7
LOS		B	A		B			B	A		B	A
Approach Delay		11.0			18.6			11.9			10.5	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type: CBD  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.50  
 Intersection Signal Delay: 12.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 43.4%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 4: Barrington & Duke



Dennis Building TIS  
5: Prince & Barrington

2024 - Development  
PM Peak



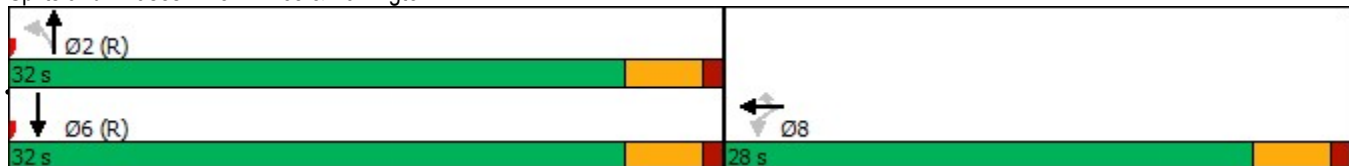
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↗	↖	↖	↗			↗	
Traffic Volume (vph)	0	0	0	14	245	59	41	336	0	0	274	28
Future Volume (vph)	0	0	0	15	257	65	43	364	0	0	288	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.6	3.6	3.0	3.0	3.0	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	0.0		0.0	15.0		15.0	0.0		15.0	0.0		0.0
Storage Lanes	0		0	1		1	1		1	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (k/h)		41			41			41				41
Link Distance (m)		41.0			54.5			49.3				119.6
Travel Time (s)		3.6			4.8			4.3				10.5
Turn Type				Perm	NA	Perm	Perm	NA				NA
Protected Phases					8			2				6
Permitted Phases				8		8	2					
Minimum Split (s)				22.5	22.5	22.5	22.5	22.5				22.5
Total Split (s)				28.0	28.0	28.0	32.0	32.0				32.0
Total Split (%)				46.7%	46.7%	46.7%	53.3%	53.3%				53.3%
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5				3.5
All-Red Time (s)				1.0	1.0	1.0	1.0	1.0				1.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0				0.0
Total Lost Time (s)				4.5	4.5	4.5	4.5	4.5				4.5
Lead/Lag												
Lead-Lag Optimize?												
Act Effect Green (s)				23.5	23.5	23.5	27.5	27.5				27.5
Actuated g/C Ratio				0.39	0.39	0.39	0.46	0.46				0.46
v/c Ratio				0.04	0.46	0.19	0.15	0.52				0.47
Control Delay				11.8	16.5	5.0	11.1	14.5				16.8
Queue Delay				0.0	0.0	0.0	0.0	0.0				0.0
Total Delay				11.8	16.5	5.0	11.1	14.5				16.8
LOS				B	B	A	B	B				B
Approach Delay					14.1			14.2				16.8
Approach LOS					B			B				B

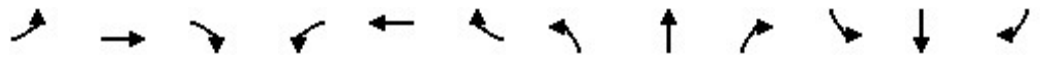
Intersection Summary

Area Type: CBD  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.52  
 Intersection Signal Delay: 14.9  
 Intersection Capacity Utilization 49.0%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 5: Prince & Barrington





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗								↖	↑
Traffic Volume (vph)	0	6	38	0	0	0	0	0	0	29	452	0
Future Volume (vph)	0	14	47	0	0	0	0	0	0	30	475	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	4.0	4.0	4.8	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grade (%)		-6%			0%			0%			0%	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (k/h)		41			41			41			41	
Link Distance (m)		56.0			43.2			66.6			55.9	
Travel Time (s)		4.9			3.8			5.8			4.9	
Turn Type		NA	Perm							Perm	NA	
Protected Phases		4									6	
Permitted Phases			4							6		
Minimum Split (s)		22.5	22.5							22.5	22.5	
Total Split (s)		26.0	26.0							34.0	34.0	
Total Split (%)		43.3%	43.3%							56.7%	56.7%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.0	1.0							1.0	1.0	
Lost Time Adjust (s)		0.0	0.0								0.0	
Total Lost Time (s)		4.5	4.5								4.5	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)		21.5	21.5								29.5	
Actuated g/C Ratio		0.36	0.36								0.49	
v/c Ratio		0.02	0.10								0.36	
Control Delay		8.9	3.6								9.8	
Queue Delay		0.0	0.0								0.0	
Total Delay		8.9	3.6								9.8	
LOS		A	A								A	
Approach Delay		4.8									9.8	
Approach LOS		A									A	

Intersection Summary

Area Type:	CBD
Cycle Length:	60
Actuated Cycle Length:	60
Offset:	0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.36
Intersection Signal Delay:	9.2
Intersection LOS:	A
Intersection Capacity Utilization:	40.6%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 302: Hollis & George

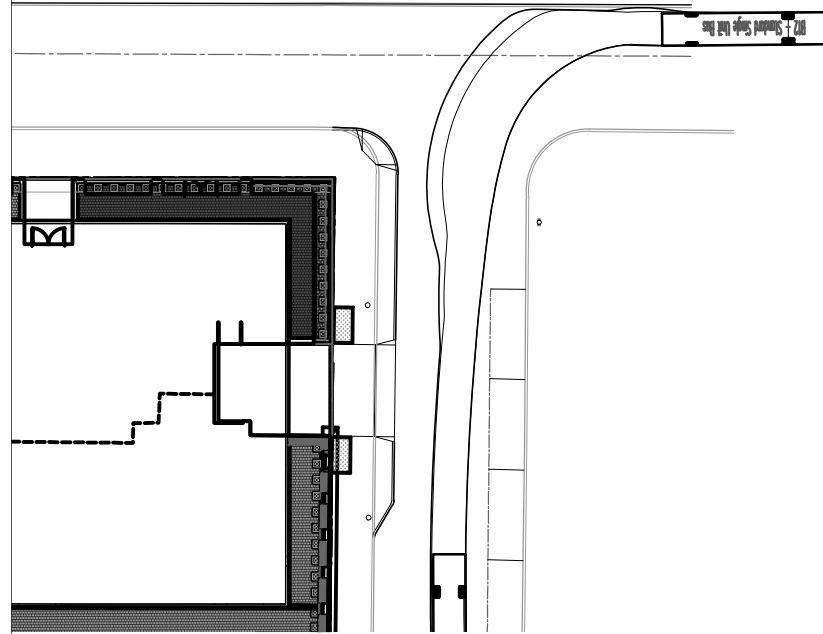


Lanes, Volumes, Timings

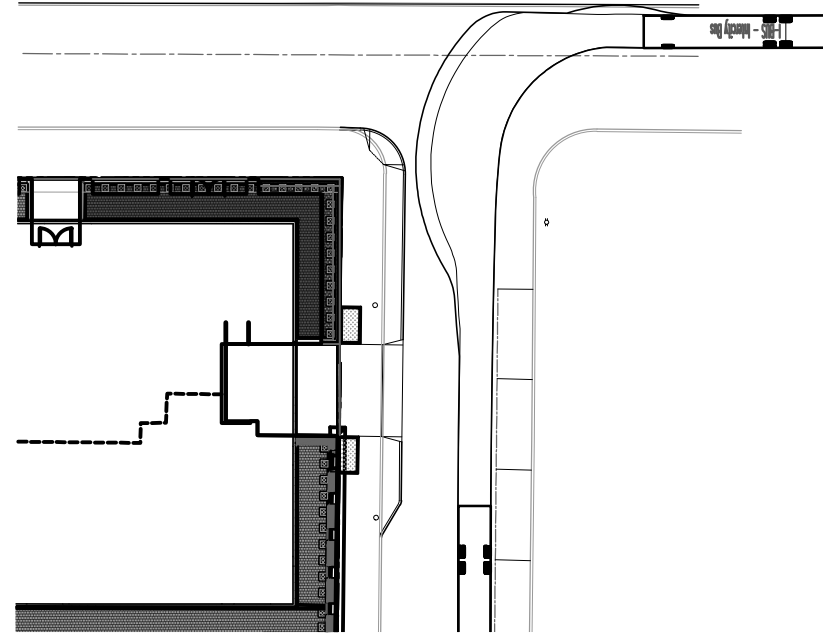
# APPENDIX E

## Appendix E: BUS TURNING TEMPLATES

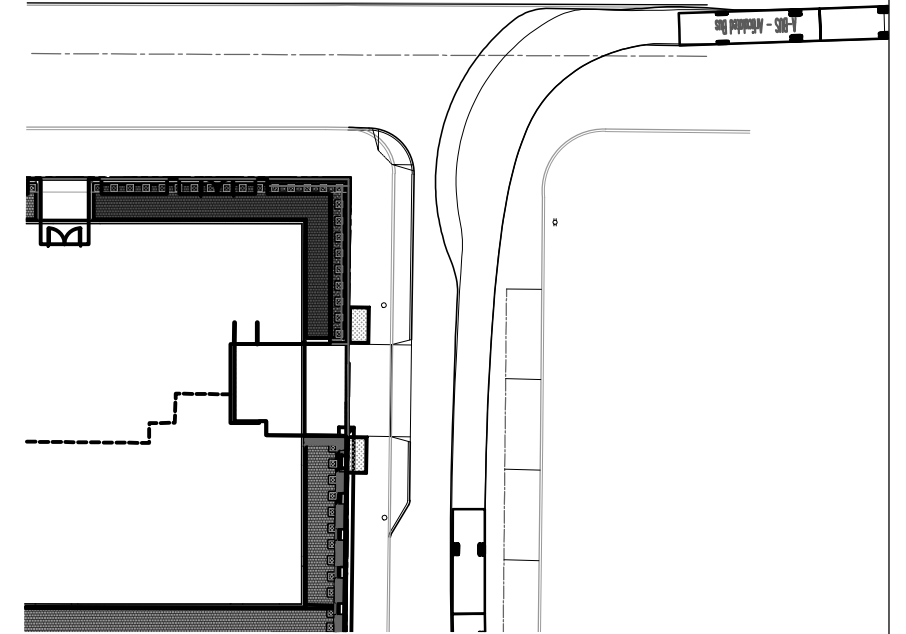
# BUS TURNING TEMPLATES



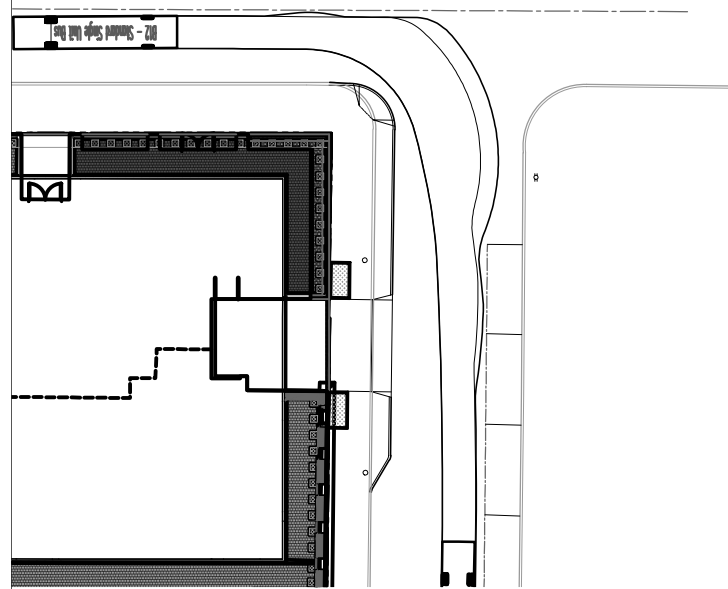
TAC Single Unit Bus - Left Turn



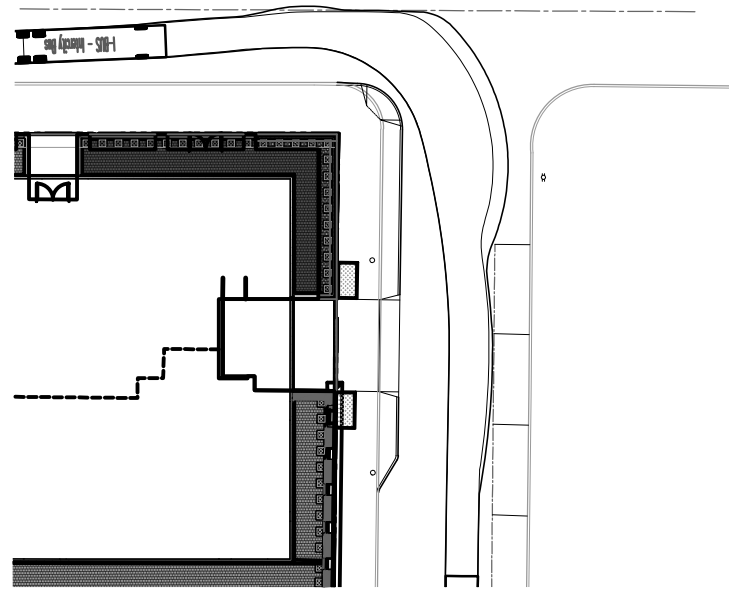
TAC Intercity Bus - Left Turn



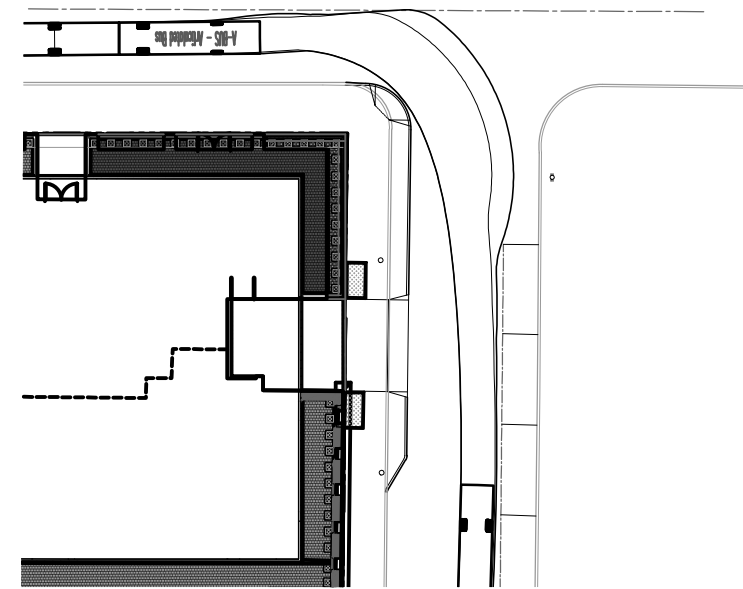
TAC Articulated Bus - Left Turn



TAC Single Unit Bus - Right Turn



TAC Intercity Bus - Right Turn



TAC Articulated Bus - Right Turn

