TRAFFIC IMPACT STUDY
THE PROMENADE

PREPARED FOR:
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wsp

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1 INTRODUCTION

Background

Plans are being prepared for the Promenade, a multi-use development in Halifax, Nova Scotia that is bounded by Robie Street, College Street, Carlton Street, and a neighbouring planned development to the immediate north (see Figure 1).

There are two other nearby developments that are expected to be constructed within the study area, and this revised Traffic Impact Study (TIS) evaluates the impacts of the proposed development in combination with these other approved developments.

WSP Canada Inc. has been retained to complete a revised TIS for the proposed multi-use development (see Figure 2). This revised TIS has been prepared to address HRM's comments dated September 6, 2024 on the previous TIS submission (May 2020).

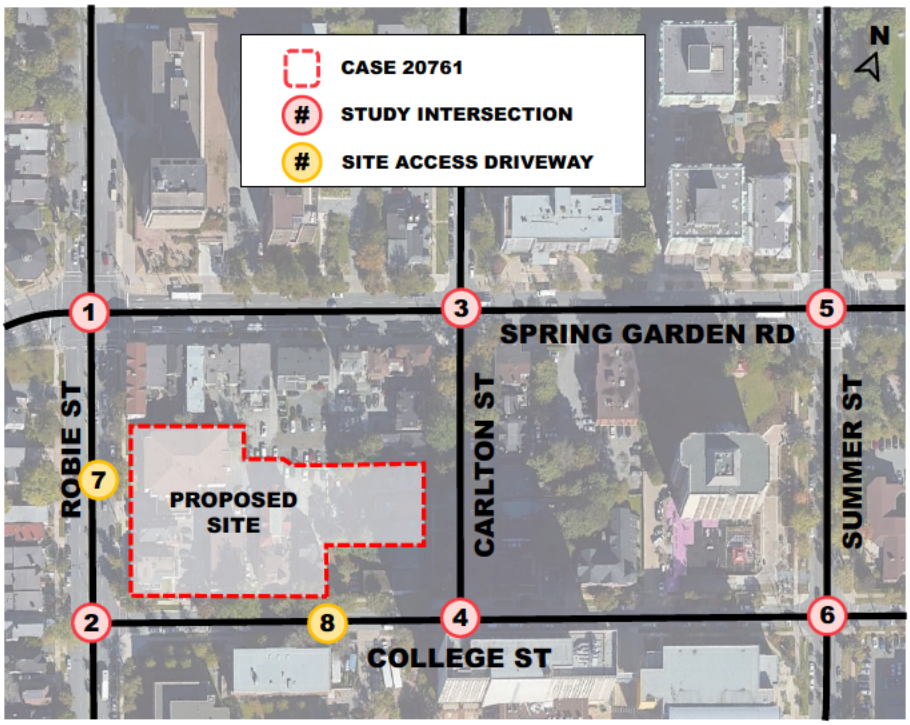


Figure 1 – Study Area

A Traffic Impact Study Usually Considers Four Questions

A TIS usually consists of determining answers for the following questions:

1. **What is the existing transportation situation** adjacent to the study site? How have volumes changed historically?
2. **What transportation changes are expected** at key Study Area locations? How many vehicle and active mode trips are expected to be generated by the proposed development during weekday peak hours? What routes are the trips expected to use to travel within and through the Study Area?
3. **What transportation impacts will occur** on Study Area roads, sidewalks, and intersections?
4. **What transportation improvements are required** to mitigate project impacts on Study Area travel? Are there transportation modifications that should be made to improve the travel experience for all users?

Study Objectives

1. Establish existing traffic conditions in the Study Area.
2. Estimate the number of AM and PM vehicles trips that are expected to be generated by the two nearby developments.
3. Develop projected 2033 background weekday AM and PM peak hourly volumes for Study Area roads that include trips generated by the background developments but do not include trips generated by the Promenade site development.
4. Estimate the number of weekday AM and PM peak hour trips that will be generated by the Promenade.
5. Distribute and assign site generated trips to Study Intersections to project 2033 peak hourly volumes that include site generated trips.
6. Evaluate impacts of site generated traffic on the performance of Study Intersections and recommend improvements that may be needed at study intersections to mitigate the impacts of site development.

Figure 2 – Site Plan

2 STUDY AREA DESCRIPTIONS

Description of Existing Site

The existing site is occupied by six (6) residential properties. There are three (3) buildings that front College Street:

- 5977 College Street (PID 00135517) is a 4-storey residential building with 12 dwelling units (see Photo 1);
- 5969 College Street (PID 00135509) is a 3-storey designated "Heritage Building" with 17 dwelling units (see Photo 2);
- 5963 College Street (PID 00135491) is a 3-storey residential building with 4 dwelling units (see Photo 3); and,

There are two (2) properties that front Robie Street:

- 1389 Robie Street (PID 00135541) is a 3-storey residential building with 24 dwelling units (see Photo 4); and,
- 1377 Robie Street (PID 00135533) is a 2-storey residential building with 4 dwelling units (see Photo 5).

There is one (1) property on the corner of Robie Street and College Street:

- 5993 College Street (PID 00135525) is a 3-storey residential building with 4 dwelling units (see Photo 6).

Photo 1 – 5977 College Street

Photo 2 – 5969 College Street

Photo 3 – 5963 College Street

Photo 4 – 1389 Robie Street

Photo 5 – 1377 Robie Street

Photo 6 – 5993 College Street

Description of Proposed Redevelopment

The proposed multi-use development is bounded by Robie Street, College Street and Carlton Street in Halifax, Nova Scotia (see Figure 2). The Promenade is expected to be developed in two (2) phases. Phase 1 is planned to include 34 mid-rise apartments on the corner of Carlton Street and College Street (PID 00135475 and 00135483). Phase 2 is expected to include 60 mid-rise apartment units, 790 high-rise apartment units, approximately 8,755 ft^2 of commercial space, and an underground parking garage consisting of 511 parking spots. The proposed redevelopment will include the demolition of five (5) of the existing six (6) buildings on the site and the relocation of the designated "Heritage Building" within the boundaries of Phase 1. Completion of Phase 1 is anticipated by 2025 and Phase 2 by 2028.

Proposed Site Access

There are numerous pedestrian accesses to the proposed development (See Figure 2). Vehicular access to the proposed underground parking garage is expected to be via College Street. Sight distance is sufficient at the proposed site connection (see Photo 7 and Photo 8). It is expected that an additional access accommodating right-in and right-out (RIRO) maneuvers only will be provided on Robie Street as a drop off driveway and to service heavy vehicle deliveries / garbage pick up, etc. It is understood that there will be service doors from the Robie Street connection to access the building that provide space for entry into the building by service vehicles. Accommodation of these heavy vehicles will be required during the detailed design of the access to Robie Street.

Photo 7 – Looking Left (East) on College Street towards Carlton Street

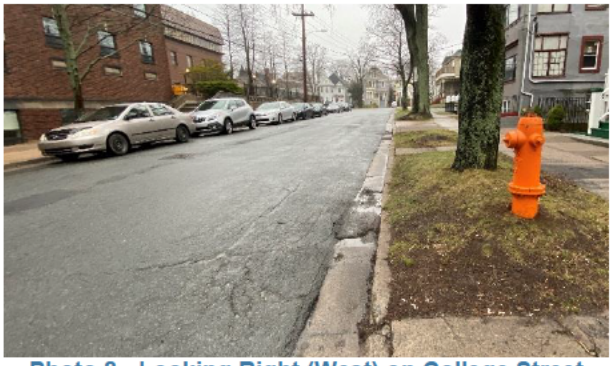


Photo 8 - Looking Right (West) on College Street towards Robie Street

Existing Road Descriptions

Robie Street is a major collector street that runs north-south approximately 5.5 km between the North End and South End of Halifax. In the vicinity of the proposed development, Robie Street has two traffic lanes in each direction divided by a median and sidewalks on both sides. The posted speed limit is 50 km/h and metered parking is provided on both sides of Robie Street.

College Street is a local road that runs east-west approximately 500 m between Robie Street and Cathedral Lane. College Street consists of one lane in each direction with sidewalks on both sides and the posted speed limit is 50 km/h. Metered parking is provided on the south side of College Street.

Carlton Street is a local road that runs north-south approximately 250 m between the Camp Hill Cemetery and College Street. Carlton Street consists of one lane in each direction with sidewalks on both sides and the posted speed limit is 50 km/h.

Spring Garden Road is an undivided local collector street that runs east-west approximately 1.2 km between Robie Street and Barrington Street. Spring Garden Road consists of numerous residential and commercial properties, access driveways, bus stop locations and metered parking. There are sidewalks on both sides as this corridor is used heavily by pedestrians. The posted speed limit is 50 km/h.

Summer Street is a local street that runs north-south approximately 900 m between Bell Road and University Avenue. In the vicinity of the proposed development, Summer Street has one lane in each direction divided by a median and sidewalks on both sides. The posted speed limit is 50 km/h.

Intersection 1 – Robie Street and Spring Garden Road/Coburg Road is a 4-leg signalized intersection with pedestrian crosswalks on all approaches (see Photo 9). The northbound and southbound approaches consist of one through/left-turn lane, one through lane and a right-turn lane. The eastbound approach (Coburg Road) consists of one left turn lane and a through/right-turn lane and the westbound approach (Spring Garden Road) consists of one through/left-turn lane and a through/right-turn lane.

Photo 9 – Robie Street at Spring Garden Road and Coburg Road

Intersection 2 – Robie Street and College Street is a 3-leg stop-controlled intersection with free flow on Robie Street (see Photo 10). The northbound approach consists of one through lane and one through/right-turn lane, the southbound approach consists of one through lane and one through/left-turn lane. The eastbound approach (College Street) consists of one lane with a marked pedestrian crossing consisting of parallel lines.

Photo 10 – Robie Street and College Street

Intersection 3 – Spring Garden Road and Carlton Street is a 4-leg stop-controlled intersection with free flow on Spring Garden Road (see Photo 11). All approaches consist of single lanes and there is an RA-5 pedestrian crossing located on the crossing the east leg.

Photo 11 – Spring Garden Road and Carlton Street

Intersection 4 – College Street and Carlton Street is a 3-leg stop-controlled intersection with free flow on the College Street (see Photo 12). All approaches consist of single lanes and there are no marked pedestrian crosswalks.

Photo 12 – College Street and Carlton Street

Intersection 5 – Spring Garden Road and Summer Street is a 4-leg signalized intersection with pedestrian crosswalks on all approaches (see Photo 13). The westbound approach consists of one through/left-turn lane and a right-turn lane that is supplemented with a transit priority signal. The eastbound approach consists of one through/left-turn lane and a through/right-turn lane. The southbound approach consists of one through/left-turn lane and a right-turn lane, right turns are prohibited during red lights at this approach.

Photo 13 – Spring Garden Road and Summer Street

Intersection Descriptions (Continued)

Intersection 6 – College Street and Summer Street is a 4-leg stop-controlled intersection with free flow on Summer Street (see Photo 14). All approaches consist of single lanes and there are marked crosswalks crossing the east, west and north legs of the intersection.

Photo 14 – College Street and Summer Street

Turning Movement Counts

Turning movement counts for Robie Street at Spring Garden Road/Coburg Road were obtained from HRM for the morning and evening peak periods on Thursday, November 24, 2022. Traffic volumes were collected by WSP at each of the 6 existing Study Intersections during the morning and evening peak periods on Tuesday, March 3 through Thursday, March 5, 2020. The turning movement counts have been tabulated in Tables A-1 to A-6, Appendix A, with peak hour volumes indicated by shaded areas. A review of the 2020 and 2022 turning movement counts at the Robie Street at Spring Garden Road intersection indicates minimal change in traffic volumes between these two counts. The March 2020 turning movement counts were collected prior to the COVID pandemic and are considered to be applicable for the remaining 5 existing study intersections.

Active Transportation & Transit

The proposed site has good accessibility for pedestrians. There are sidewalks on both sides of all corridors in the Study Area and marked crosswalks at all Study Intersections.

Halifax Transit currently operates several routes near the proposed redevelopment site (see Figure 3), with many bus stops located on Robie Street and Spring Garden Road. Robie Street is a planned transit priority corridor and

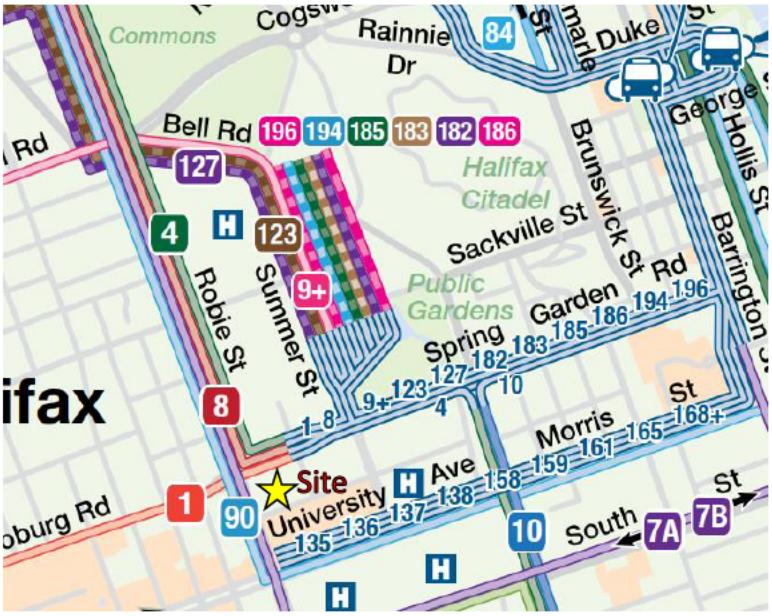


Figure 3 – Halifax Transit Routes

3 BACKGROUND TRAFFIC

Other Anticipated Developments in the Study Area

HRM requested the inclusion of two (2) approved developments in the Study Area as background growth. One of the background developments is expected to be located adjacent to the proposed redevelopment site (Case 20218) and the other background development is expected to be located at 5885 Spring Garden Road (Killam Property) (see Figure 4).

Both of the background developments considered are currently occupied by other existing properties. The adjacent property (Case 20218 in Figure 4) is currently occupied by several residential and commercial properties and is expected to consist of 250 high-rise apartment units, 61,000 ft^2 of office space and 21,000 ft^2 of commercial space. The Killam Property is currently occupied by a 201-unit high-rise apartment building and the redeveloped property is expected to be a 305-unit high-rise apartment building.

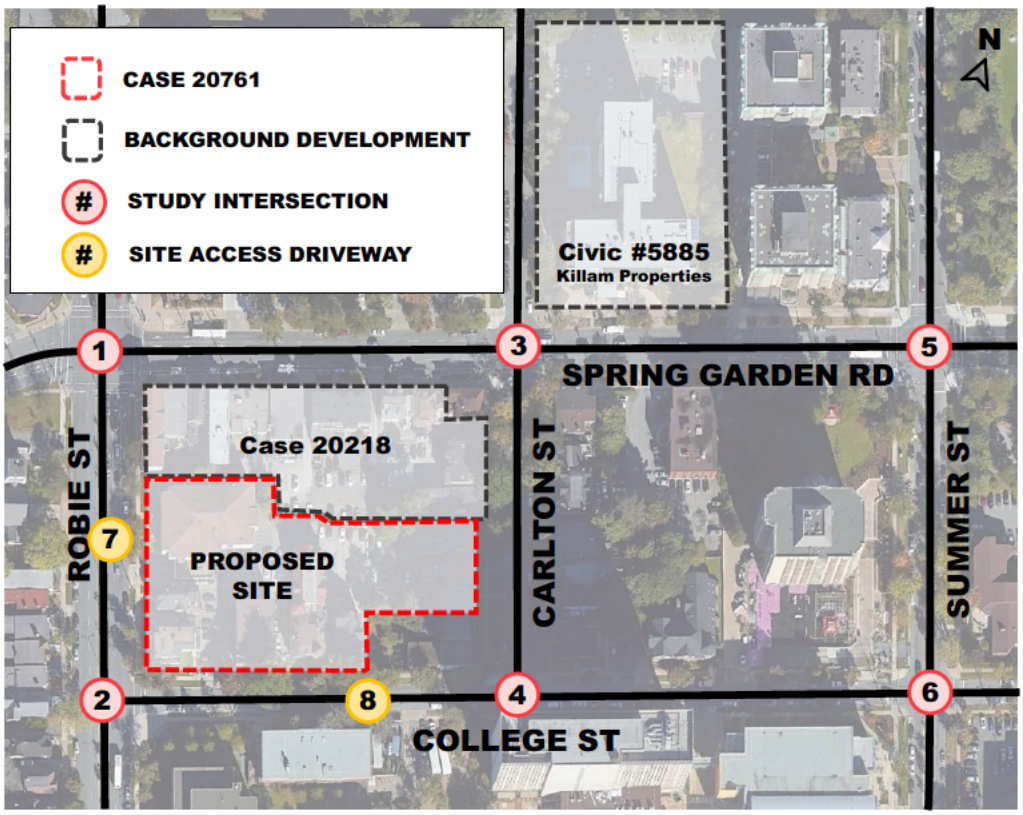


Figure 4 – Locations of Background Developments

Annual Growth

This revised Traffic Impact Study accounts for the adjacent developments as the background growth of traffic in the area, therefore, no annual growth factor was applied to the traffic volumes. This is consistent with the previous TIS.

4 TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

Anticipated Land Use for Proposed Redevelopment

Phase 1 of the Promenade is expected to include 34 Mid-Rise Apartment units. Phase 2 is planned to include 60 Mid-Rise Apartment units, 790 High-Rise Apartment units, and 8,755 ft^2 of Commercial Space.

Anticipated Land Use for Background Developments

Case 20218 is planned to include 250 High-Rise Apartment units, 61,000 ft^2 of General Office and 21,000 ft^2 of Retail. The redeveloped Killam Property is expected to consist of 305 High-Rise Apartment Units.

Estimation of Site Generated Trips (Background Developments and Proposed Site)

When using the published rates in *Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers, Washington, 2021) the transportation engineer's objective should be to provide a realistic estimate of the number of trips that will be generated. All of the developments specifically considered in this TIS are within an area of Halifax with very high non-auto modes given the proximity to destinations for walking and cycling trips and frequent transit service along Robie Street and Spring Garden Road.

Appendix B of the ITE Trip Generation Handbook, 3rd Edition (2017) includes baseline modal share data for a variety of land use types including apartments and shopping centers.

Appendix B of the Handbook indicates that the modal share of the sample trip data for apartment and shopping center land uses was 96%-100% vehicle trips.

For this development, it is expected that significantly more than 0-4% of the person trips will be by transit and active modes and the multimodal trip generation methodology identified in Figure 3.1 of the Handbook has been applied to the trip generation estimates for this development.

Based on the developments' proximity to numerous amenities and that the site lies within an area of HRM with very high (approximately 45%) active transportation usage, many of the trips generated by the proposed development are anticipated to be non-auto trips. Using the methodology provided in *Trip Generation Handbook, 3rd Edition* (Institute of Transportation Engineers, Washington, 2017), estimates of the total person trips generated by the development were prepared.

With residential and retail land uses planned for the development, many of the trips generated by the sites are expected to be internal trips, those that are made between complementary land uses within the development, such as a resident visiting a store on the ground level who never leaves the site. The National Cooperative Highway Research Program (NCHRP) Report 684 – *Enhancing Internal Trip Capture for Mixed-Use Developments* provides an estimation tool for considering internal trips. Output worksheets from this estimation tool are included in Appendix A.

Generated trips for Low-Rise Apartments (Land Use 220), Mid-Rise Apartments (Land Use 221), and High-Rise Apartments (Land Use 222) are estimated for the AM and PM peak hours of traffic by the number of residential units. Trips generated for Shopping Plaza (Land Use 821) and General Office Building (Land Use 710) are estimated for the AM and PM peak hours of traffic by leasable or gross square footage available.

Trips Generated from Case 20218

The adjacent property is currently occupied by numerous residential properties and commercial destinations. It was estimated that the proposed commercial development will approximately occupy the same leasable square footage and consist of similar land usages (e.g. coffee shops, restaurants, salons, etc.) as the existing site. The trip generation estimates of the proposed site and the vehicle trip credits for the existing site were assumed to be equivalent, therefore, the trips generated by the commercial development are captured in the traffic counts collected between March 3-5, 2020 by WSP and in 2022 at the Robie Street at Spring Garden Road intersection by HRM. The trip generation estimate for Case 20218 is summarized in Table 1.

It is estimated that Case 20218 will generate:

- 188 new two-way external person trips during the AM peak hour (116 entering and 72 exiting); and,
- 205 new two-way external person trips during the PM peak hour (78 entering and 127 exiting).

Table 1 – Trip Generation Estimates for Case 20218 (Adjacent Site)

Land Use[1]	Units[2]	Trip Generation Rates[4]				Trip Generation Estimates[4]			
		AM Peak		PM Peak		AM Peak		PM Peak	
		In	Out	In	Out	In	Out	In	Out
Adjacent Site (Case 20218)									
Multi-Unit High-Rise (Land Use 222)	250 Units	Equations from Pages 307 and 308				19	55	55	33
General Office Building (Land Use 710)	61.0 KGLA	Equations from Pages 710 and 711				96	13	19	91
Shopping Plaza (40-150K) - Supermarket - No[3] (Land Use 821)	21.0 KGLA	No change between existing and proposed.				0	0	0	0
Baseline Vehicle Trip Estimates for Proposed Development						115	68	74	124
Total Person Trips[5]						117	73	82	131
Internal Person Trips[6]						1	1	4	4
External Person Trips[6]						116	72	78	127

NOTES:

1. Land use codes, rates and equations are from Trip Generation 11th Edition, Institute of Transportation Engineers, Washington, 2021.
2. 'Number of Residential Units' for High-Rise Apartment. 'Gross Leasable Area x 1000 SF' for General Office and Shopping Plaza.
3. Shopping Plaza equations have been used for commercial developments.
4. Rates are 'vehicles per hour per unit'; trips generated are 'vehicles per hour for peak hours'.
5. Baseline vehicle trips using historical trip generation data from Trip Generation, 11th Edition have been converted to person trips using methodology and conversion factors provided in Trip Generation Handbook, 3rd Edition (Institute of Transportation Engineers, 2017).
6. Internal and external person trip estimates are based on methodology from National Cooperative Highway Research Program (NCHRP) 684 with associated worksheets included in Appendix A.

Trips Generated from Killam Property

The existing Killam Property located at 5885 Spring Garden Road consists of a High-Rise Apartment with 201 units, therefore, a credit was applied to the trip generation to estimate the new person trips generated by the redevelopment. The trip generation estimate for the redeveloped Killam Property is summarized in Table 2.

It is estimated that the Killam Property will generate:

- 27 new two-way external person trips during the AM peak hour (8 entering and 19 exiting); and,
- 33 new two-way external person trips during the PM peak hour (20 entering and 13 exiting).

Table 2 – Trip Generation Estimates for Redeveloped Killam Property

Land Use[1]	Units[2]	Trip Generation Rates[3]				Trip Generation Estimates[3]			
		AM Peak		PM Peak		AM Peak		PM Peak	
		In	Out	In	Out	In	Out	In	Out
Killam Site (5885 Spring Garden Road)									
Multi-Unit High-Rise (Land Use 222)	305 Units	Equations from Pages 307 and 308				22	64	64	39
Removal of Multi-Unit High-Rise (Land Use 222)	201 Units	Equations from Pages 307 and 308				-16	-47	-47	-29
Baseline Vehicle Trip Estimates for Proposed Development						6	17	17	10
Total Person Trips[4]						8	19	20	13

NOTES:
1. Land use codes, rates and equations are from Trip Generation 11th Edition, Institute of Transportation Engineers, Washington, 2021.
2. 'Number of Residential Units' for High-Rise Apartment.
3. Rates are 'vehicles per hour per unit'; trips generated are 'vehicles per hour for peak hours'.
4. Baseline vehicle trips using historical trip generation data from Trip Generation, 11th Edition have been converted to person trips using methodology and conversion factors provided in Trip Generation Handbook, 3rd Edition (Institute of Transportation Engineers, 2017). As this development is only residential, no on-site synergies have been considered.

Estimated Modal Shares of the Background Development Trips

Many of the trips generated by these background developments are expected to be made via active and transit modes with 40% as auto driver. These modal shares are generally consistent with the 2016 census tract data and are in line with HRM's modal share targets within the *Integrated Mobility Plan* for the urban centre.

It is estimated that the Adjacent Site development will generate (See Table 3):

- 75 two-way vehicle trips (46 entering and 29 exiting) during the AM peak hour; and,
- 82 two-way vehicle trips (31 entering and 51 exiting) during the PM peak hour.

It is estimated that redeveloped Killam Property will generate (See Table 4):

- 11 two-way vehicle trips (4 entering and 7 exiting) during the AM peak hour; and,
- 13 two-way vehicle trips (8 entering and 5 exiting) during the PM peak hour.

Table 3 – Modal Share Estimates for Case 20218 (Adjacent Site)

Travel Mode	Modal Share	AM Peak		PM Peak	
		In	Out	In	Out
External Person Trips		**116**	**72**	**78**	**127**
Auto Driver	**40%**	**46**	**29**	**31**	**51**
Auto Passenger	**5%**	6	4	4	6
Transit	**10%**	12	7	8	13
Active Modes	**45%**	52	32	35	57

Table 4 – Modal Share Estimates for Redeveloped Killam Property

Travel Mode	Modal Share	AM Peak		PM Peak	
		In	Out	In	Out
External Person Trips		**8**	**19**	**20**	**13**
Auto Driver	**40%**	**4**	**7**	**8**	**5**
Auto Passenger	**5%**	0	1	1	1
Transit	**10%**	1	2	2	1
Active Modes	**45%**	3	9	9	6

Trips Generated from the Promenade

The site planned for Phase 2 is currently occupied by six (6) residential properties totalling 65 dwelling units. The proposed redevelopment will include the demolition of five (5) of the existing buildings on the site and the designated "Heritage Building" will be relocated with five (5) remaining units. Fronting onto Carlton Street there are also six (6) low-rise residential units within three heritage buildings in addition to the proposed mid-rise units. These six units have been included as trip generation, reducing the total units being removed to 59 (from 65). The trip generation estimate for The Promenade is summarized in Table 5.

It is estimated that the Promenade will generate:

- 211 two-way external person trips during the AM peak hour (68 entering and 143 exiting); and,
- 309 two-way external person trips during the PM peak hour (181 entering and 127 exiting).

Table 5 – Trip Generation Estimates for the Promenade

Phase	Land Use[1]	Units[2]	Trip Generation Rates[4]				Trip Generation Estimates[4]			
			AM Peak		PM Peak		AM Peak		PM Peak	
			In	Out	In	Out	In	Out	In	Out
The Promenade										
Phase 1	Multi-Unit Mid-Rise (Land Use 221)	34 Units	Equations from Pages 275 and 276				1	3	8	5
Phase 2	Multi-Unit Mid-Rise (Land Use 221)	60 Units	Equations from Pages 275 and 276				3	11	14	9
	Multi-Unit High-Rise (Land Use 222)	790 Units	Equations from Pages 307 and 308				50	143	142	87
	Shopping Plaza (40-150K) - Supermarket - No[3] (Land Use 821)	8.8 KGLA	1.07	0.66	2.54	2.65	9	6	22	23
Removal of Existing Land Use	Multi-Unit Low-Rise (Land Use 220)	59 Units	Equations from Pages 255 and 256				-3	-31	-29	-17
Baseline Vehicle Trip Estimates for Proposed New Development							63	163	186	124
Estimated Baseline Vehicle Trips for New Retail							9	6	22	23
Estimated Baseline Vehicle Trips for New Residential							54	157	164	101
Total New Development External Person Trips[5]							72	178	216	149
Internal Person Trips[6]							3	3	9	9
Existing Development Person Trips[5]							-4	-35	-35	-22
New External Person Trips							68	143	181	127

NOTES:

1. Land use codes, rates and equations are from Trip Generation 11th Edition, Institute of Transportation Engineers, Washington, 2021.
2. 'Number of Residential Units' for Multi-Unit Mid-Rise, Multi-Unit High-Rise and Multi-Unit Low-Rise Apartments. 'Gross Leasable Area x 1000 SF' for Shopping Plaza.
3. Shopping Plaza equations have been used for commercial developments.
4. Rates are 'vehicles per hour per unit'; trips generated are 'vehicles per hour for peak hours'.
5. Baseline vehicle trips using historical trip generation data from Trip Generation, 11th Edition have been converted to person trips using methodology and conversion factors provided in Trip Generation Handbook, 3rd Edition (Institute of Transportation Engineers, 2017).
6. Internal and external person trip estimates are based on methodology from National Cooperative Highway Research Program (NCHRP) 684 with associated worksheets included in Appendix A.

Estimated Modal Shares of the Promenade Development Trips

It is estimated that the Promenade development will generate (See Table 6):

- 85 two-way vehicle trips (27 entering and 58 exiting) during the AM peak hour; and,
- 124 two-way vehicle trips (72 entering and 51 exiting) during the PM peak hour.

Table 6 – Modal Share Estimates for The Promenade

Travel Mode	Modal Share	AM Peak		PM Peak	
		In	Out	In	Out
External Person Trips		**68**	**143**	**181**	**127**
Auto Driver	**40%**	**27**	**58**	**72**	**51**
Auto Passenger	**5%**	3	7	9	6
Transit	**10%**	7	14	18	13
Active Modes	**45%**	31	64	82	57

Trip Distribution and Assignment

Vehicle trips generated by the background developments and proposed development were assigned to the roadway network based on the turning movement counts and local knowledge of the area considering major trip origins and destinations in the region. While several of the trips are likely destined to and from the more immediate area such as downtown Halifax to the east, many of these trips are expected to be made via the non-auto modes.

North	60%	(Halifax Commons, Hospital, North End Halifax, Bedford, Dartmouth/Burnside/Fall River via McKay Bridge or Macdonald Bridge)
East	10%	(Downtown Halifax various possible destinations)
South	20%	(South End Halifax, Dalhousie University, St. Mary's University, Hospital, etc.)
West	10%	(Halifax Shopping Centre, Bayers Lake, Highway 102, Armdale Roundabout, etc.)

Projected 2033 Traffic Volumes with Background Developments and without the Promenade

Trips generated by the background developments have been added to the observed traffic volumes to provide projected 2033 AM and PM peak hourly volumes that do not include The Promenade site generated trips. The 2033 traffic volumes with the background developments taken into consideration are illustrated diagrammatically in Figure A-1, Appendix A.

Projected 2033 Traffic Volumes with Background Developments and the Promenade

Trips generated by the proposed site (Figure A-2, Appendix A) have been added to the 2033 traffic volumes with the background developments (Figure A-1, Appendix A) to provide projected 2033 AM and PM peak hourly volumes that include The Promenade site generated trips. The 2033 traffic volumes with the background developments and the proposed site are illustrated diagrammatically in Figure A-3, Appendix A.

5 INTERSECTION OPERATIONAL ANALYSIS

Intersection Capacity Analysis

Intersection capacity analysis was completed to estimate how the Study Intersections may be expected to operate in the future without and with site generated trips.

Synchro 11 software was used to evaluate the performance of the Study Intersections for the following scenarios:

Scenario 1: Projected 2033 AM and PM peak hour volumes with background developments; and,
Scenario 2: Projected 2033 AM and PM peak hour volumes with proposed site and background developments.

Pedestrian crossing volumes have been included in the analysis at each intersection and each scenario. The following subsections identify each study intersection and summarize the results of the operational analysis. Detailed results of the analyses are included in Appendix B.

Intersection Capacity Analysis Results

Intersection 1 – Robie Street and Spring Garden Road/Coburg Road (Table 7) – The intersection with the background developments is expected to operate within capacity during the AM and PM peak hours. With the background developments and the Promenade, all movements are expected to operate within HRM acceptable limits in each scenario.

Intersection 2 – Robie Street and College Street (Table 8) – The intersection with the background developments is expected to operate well under capacity during the AM and PM peak hours. With the background developments and the Promenade, all movements are expected to operate within HRM acceptable limits in each scenario.

Intersection 3 – Spring Garden Road and Carlton Street (Table 9) – The intersection with the background developments is expected to operate well under capacity during the AM and PM peak hours. With the background developments and the Promenade, all movements are expected to operate within HRM acceptable limits in each scenario.

Intersection 4 – College Street and Carlton Street (Table 10) – The intersection with the background developments is expected to operate well under capacity during the AM and PM peak hours. With the background developments and the Promenade, all movements are expected to operate within HRM acceptable limits in each scenario.

Intersection 5 – Spring Garden Road and Summer Street (Table 11) – The intersection with the background developments is expected to operate under capacity during the AM and PM peak hours. With the background developments and the Promenade, all movements are expected to operate within HRM acceptable limits in each scenario.

Intersection 6 – College Street and Summer Street (Table 12) – The intersection with the background developments is expected to operate under capacity during the AM and PM peak hours. With the background developments and the Promenade, all movements are expected to operate within HRM acceptable limits except the eastbound approach with a v/c ratio of 0.88. While high delay is noted on the eastbound approach, this is caused by heavy pedestrian volumes crossing at this intersection. The approach is low volume and is expected to operate within its capacity in all scenarios.

Intersection 7 – Robie Street and Site Driveway A (Table 13) – With the addition of site generated trips, this intersection is expected to operate well and within HRM guidelines.

Intersection 8 – College Street and Site Driveway B (Table 14) – With the addition of site generated trips, this intersection is expected to operate well and within HRM guidelines.

Table 7 – Intersection Capacity Analysis for Robie Street at Spring Garden Road/Coburg Road

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement								Overall Intersection	
	Coburg Road			Spring Garden Road	Robie Street					
	EB-L	EB-T	EB-R	WB-LTTR	NB-LTT	NB-R	SB-LTT	SB-R	Delay	Control
Scenario 1 - 2033 Future Background Traffic without Site Development AM Peak Hour (Page B-1)										
Delay	54.2	49.5	1.1	40.3	5.3	0.9	9.4	1.5	15.2	
v/c	0.49	0.61	0.12	0.77	0.31	0.06	0.65	0.06		
Queue	21.4	50.4	0.0	36.7	31.6	2.7	87.6	3.5		
Scenario 2 - 2033 Total Traffic with Site Development AM Peak Hour (Page B-15)										
Delay	54.4	49.5	1.3	40.5	5.5	1.0	9.7	1.7	15.3	
v/c	0.49	0.61	0.13	0.78	0.33	0.06	0.67	0.06		
Queue	21.4	50.4	0.0	36.8	33.7	2.7	90.4	3.8		
Scenario 1 - 2033 Future Background Traffic without Site Development PM Peak Hour (Page B-8)										
Delay	80.1	34.6	0.7	25.7	8.9	1.1	8.1	3.4	15.0	
v/c	0.80	0.39	0.10	0.70	0.53	0.08	0.42	0.06		
Queue	32.2	34.0	0.0	33.8	73.6	2.9	41.1	5.9		
Scenario 2 - 2033 Total Traffic with Site Development PM Peak Hour (Page B-24)										
Delay	83.9	34.9	1.0	26.1	9.1	1.1	8.1	3.3	15.1	
v/c	0.81	0.39	0.13	0.71	0.55	0.08	0.43	0.06		
Queue	33.7	34.6	0.4	34.5	74.6	2.8	41.5	5.7		

Table 8 – Intersection Capacity Analysis for Robie Street at College Street

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement					Overall Intersection	
	College Street	Robie Street					
	WB-LR	NB-T	NB-TR	SB-LT	SB-T	Delay	Control
Scenario 1 - 2033 Future Background Traffic without Site Development AM Peak Hour (Page B-4)							
Delay	18.3	0.0	0.0	2.8	0.0	1.2	
v/c	0.17	0.22	0.13	0.55	0.42		
Queue	4.8	0.0	0.0	2.6	0.0		
Scenario 2 - 2033 Total Traffic with Site Development AM Peak Hour (Page B-18)							
Delay	18.8	0.0	0.0	3.2	0.0	1.6	
v/c	0.24	0.22	0.13	0.57	0.42		
Queue	7.0	0.0	0.0	3.1	0.0		
Scenario 1 - 2033 Future Background Traffic without Site Development PM Peak Hour (Page B-11)							
Delay	22.8	0.0	0.0	2.3	0.0	1.4	
v/c	0.28	0.39	0.20	0.33	0.19		
Queue	8.9	0.0	0.0	1.3	0.0		
Scenario 2 - 2033 Total Traffic with Site Development PM Peak Hour (Page B-27)							
Delay	25.8	0.0	0.0	4.4	0.0	2.1	
v/c	0.37	0.39	0.21	0.39	0.19		
Queue	12.9	0.0	0.0	2.8	0.0		

Table 9 – Intersection Capacity Analysis for Spring Garden Road at Carlton Street

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement				Overall Intersection	
	Spring Garden Road		Carlton Street			
	EB-LTR	WB-LTR	NB-LTR	SB-LTR	Delay	Control
Scenario 1 - 2033 Future Background Traffic without Site Development AM Peak Hour (Page B-5)						
Delay	0.7	0.8	27.4	20.1	3.0	
v/c	0.29	0.40	0.17	0.16		
Queue	0.4	0.6	4.9	4.4		
Scenario 2 - 2033 Total Traffic with Site Development AM Peak Hour (Page B-19)						
Delay	0.7	0.8	28.2	20.2	3.1	
v/c	0.29	0.41	0.18	0.16		
Queue	0.4	0.6	5.1	4.4		
Scenario 1 - 2033 Future Background Traffic without Site Development PM Peak Hour (Page B-12)						
Delay	1.0	0.9	46.1	59.8	7.8	
v/c	0.53	0.49	0.37	0.52		
Queue	0.8	0.6	12.2	19.5		
Scenario 2 - 2033 Total Traffic with Site Development PM Peak Hour (Page B-28)						
Delay	1.0	0.9	50.2	61.8	8.2	
v/c	0.53	0.51	0.39	0.53		
Queue	0.8	0.7	13.2	19.9		

Table 10 – Intersection Capacity Analysis College Street at Carlton Street

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement			Overall Intersection	
	College Street		Carlton Street		
	EB-LT	WB-TR	SB-LR	Delay	Control
Scenario 1 - 2033 Future Background Traffic without Site Development AM Peak Hour (Page B-6)					
Delay	1.8	0.0	10.8	2.9	
v/c	0.06	0.03	0.05		
Queue	0.4	0.0	1.3		
Scenario 2 - 2033 Total Traffic with Site Development AM Peak Hour (Page B-20)					
Delay	1.4	0.0	11.3	2.5	
v/c	0.09	0.04	0.05		
Queue	0.4	0.0	1.4		
Scenario 1 - 2033 Future Background Traffic without Site Development PM Peak Hour (Page B-13)					
Delay	2.6	0.0	11.1	3.0	
v/c	0.04	0.06	0.06		
Queue	0.3	0.0	1.6		
Scenario 2 - 2033 Total Traffic with Site Development PM Peak Hour (Page B-29)					
Delay	1.7	0.0	11.5	2.4	
v/c	0.06	0.08	0.07		
Queue	0.3	0.0	1.7		

Table 11 – Intersection Capacity Analysis for Spring Garden Road at Summer Street

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement						Overall Intersection	
	Spring Garden Road			Summer Street				
	EB-LTTR	WB-LT	WB-TRANSIT & R	NB-LTR	SB-LT	SB-R	Delay	Control
Scenario 1 - 2033 Future Background Traffic without Site Development AM Peak Hour (Page B-2,B-3)								
Delay	19.3	20.1	5.6	21.5	37.4	20.2	24.8	
v/c	0.28	0.17	0.13	0.50	0.83	0.37		
Queue	33.4	28.4	8.1	42.9	79.0	27.1		
Scenario 2 - 2033 Total Traffic with Site Development AM Peak Hour (Page B-16,B-17)								
Delay	19.6	20.4	5.8	21.7	38.3	19.7	25.2	
v/c	0.28	0.17	0.14	0.52	0.84	0.36		
Queue	33.4	28.8	8.2	46.1	81.0	26.8		
Scenario 1 - 2033 Future Background Traffic without Site Development PM Peak Hour (Page B-9,B-10)								
Delay	19.4	21.0	6.1	33.6	21.4	19.3	24.1	
v/c	0.28	0.28	0.16	0.81	0.45	0.34		
Queue	30.8	45.0	8.9	89.3	37.2	24.6		
Scenario 2 - 2033 Total Traffic with Site Development PM Peak Hour (Page B-25,B-26)								
Delay	19.9	21.8	6.6	34.0	21.5	18.7	24.6	
v/c	0.29	0.30	0.19	0.82	0.48	0.33		
Queue	30.8	46.5	9.0	94.1	41.3	24.6		

Table 12 – Intersection Capacity Analysis for College Street at Summer Street

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement				Overall Intersection	
	College Street		Summer Street			
	EB-LTR	WB-LTR	NB-LTR	SB-LTR	Delay	Control
Scenario 1 - 2033 Future Background Traffic without Site Development AM Peak Hour (Page B-7)						
Delay	45.5	26.4	0.7	1.2	10.4	
v/c	0.41	0.48	0.19	0.29		
Queue	14.5	19.5	0.3	0.7		
Scenario 2 - 2033 Total Traffic with Site Development AM Peak Hour (Page B-21)						
Delay	86.0	27.7	0.7	1.1	17.4	
v/c	0.73	0.49	0.19	0.30		
Queue	33.6	20.6	0.3	0.7		
Scenario 1 - 2033 Future Background Traffic without Site Development PM Peak Hour (Page B-14)						
Delay	53.3	27.0	0.5	1.6	9.3	
v/c	0.48	0.42	0.41	0.19		
Queue	17.8	15.9	0.4	0.7		
Scenario 2 - 2033 Total Traffic with Site Development PM Peak Hour (Page B-30)						
Delay	129.0	30.2	0.6	1.4	19.9	
v/c	0.88	0.46	0.43	0.22		
Queue	42.0	18.2	0.4	0.7		

Table 13 – Intersection Capacity Analysis for Robie Street at Site Driveway A

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement					Overall Intersection	
	Site Driveway A	Robie Street					
	WB-R	NB-T	NB-TR	SB-T1	SB-T2	Delay	Control
Scenario 2 - 2033 Total Traffic with Site Development AM Peak Hour (Page B-22)							
Delay	11.1	0.0	0.0	0.0	0.0	0.0	
v/c	0.01	0.27	0.14	0.32	0.32		
Queue	0.2	0.0	0.0	0.0	0.0		
Scenario 2 - 2033 Total Traffic with Site Development PM Peak Hour (Page B-31)							
Delay	12.4	0.0	0.0	0.0	0.0	0.0	
v/c	0.01	0.42	0.21	0.17	0.17		
Queue	0.3	0.0	0.0	0.0	0.0		

Table 14 – Intersection Capacity Analysis for College Street at Site Driveway B

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement			Overall Intersection	
	College Street		Site Driveway B		
	EB-LT	WB-TR	SB-LR	Delay	Control
Scenario 2 - 2033 Total Traffic with Site Development AM Peak Hour (Page B-23)					
Delay	0.9	0.0	9.9	2.9	
v/c	0.08	0.04	0.07		
Queue	0.2	0.0	1.9		
Scenario 2 - 2033 Total Traffic with Site Development PM Peak Hour (Page B-32)					
Delay	4.1	0.0	9.7	3.4	
v/c	0.06	0.06	0.06		
Queue	0.7	0.0	1.4		

6 SUMMARY AND CONCLUSIONS

6.1 SUMMARY

Description of the Proposed Redevelopment	1.	Plans are being prepared for a multi-use development bound by Robie Street, College Street, and Carlton Street in Halifax, Nova Scotia. The proposed development is expected to include 34 mid-rise apartments in Phase 1. Phase 2 is expected to include 60 mid-rise apartment units, 790 high-rise apartment units, approximately 8,755 ft^2 of commercial space, and an underground parking garage consisting of 511 parking spots. Completion of Phase 1 is anticipated by 2025 and Phase 2 by 2028.
Proposed Site Access	2.	Full vehicular access to the proposed site is expected to be located approximately at 5963 College Street via an access to the underground parkade. A right-in/right-out driveway will also be provided on Robie Street as a drop off driveway.
Study Area Roads	3.	***Robie Street*** is a major collector street that runs north-south approximately 5.5 km between the North End and South End of Halifax. In the vicinity of the proposed development, Robie Street has two traffic lanes in each direction divided by a median and sidewalks on both sides. ***College Street*** is a local road that runs east-west approximately 500 m between Robie Street and Cathedral Lane. College Street consists of one lane in each direction with sidewalks on both sides. ***Carlton Street*** is a local road that runs north-south approximately 250 m between the Camp Hill Cemetery and College Street. Carlton Street consists of one lane in each direction with sidewalks on both sides. ***Spring Garden Road*** is an undivided local collector street that runs east-west approximately 1.2 km between Robie Street and Barrington Street. Spring Garden Road consists of numerous residential and commercial properties, access driveways, bus stop locations and metered parking. There are sidewalks on both sides as this corridor is used heavily by pedestrians. ***Summer Street*** is a local street that runs north-south approximately 900 m between Bell Road and University Avenue. In the vicinity of the proposed development, Summer Street has one lane in each direction divided by a median and sidewalks on both sides.
Other Anticipated Developments in the Study Area	4.	Two (2) approved developments in the Study Area were considered as the background growth, Case 20218 adjacent to the proposed site and Killam Property at 5885 Spring Garden Road.
Estimation of Site Generated Trips	5.	Trip generation estimates were prepared using rates published in *Trip Generation, 11th Edition* (Institute of Transportation Engineers, Washington, 2021). It is estimated that the Promenade will generate: • 211 two-way external person trips during the AM peak hour (68 entering and 143 exiting); and,

- 309 two-way external person trips during the PM peak hour (181 entering and 127 exiting).

Trip Distribution and Assignment	6.	Trips generated by the proposed development were assigned to the roadway network based on WSP's collected turning movement counts and local knowledge of the area considering major trip origins and destinations in the region. Trips were distributed to the North (60%), East (10%), South (20%) and West (10%).
Summary – Intersection Capacity Analysis	7.	***Robie Street and Spring Garden Road/Coburg Road –*** with the addition of the background developments and The Promenade, all movements are expected to operate within HRM acceptable limits. ***Robie Street and College Street –*** with the addition of the background developments and The Promenade, all movements are expected to operate within HRM acceptable limits. ***Spring Garden Road and Carlton Street*** – with the addition of the background developments and The Promenade, all movements are expected to operate within HRM acceptable limits. ***College Street and Carlton Street*** – with the addition of the background developments and The Promenade, all movements are expected to operate within HRM acceptable limits. ***Spring Garden Road and Summer Street*** – with the addition of the background developments and The Promenade, all movements are expected to operate within HRM acceptable limits. ***College Street and Summer Street*** – with the addition of the background developments and The Promenade, all movements are expected to operate within HRM acceptable limits except the eastbound approach with a v/c ratio of 0.88. ***Robie Street and Site Driveway A*** – with the addition of the background developments and The Promenade, all movements are expected to operate within HRM acceptable limits. ***College Street and Site Driveway B*** – with the addition of the background developments and The Promenade, all movements are expected to operate within HRM acceptable limits.

6.2 CONCLUSIONS

Impacts to Vehicular Traffic	8.	The overall performance of the Study Intersections are expected to be satisfactory without and with the addition of site generated trips. Minimal impacts to vehicular traffic are expected at the Study Intersections as a result of the proposed multi-use development.

APPENDIX

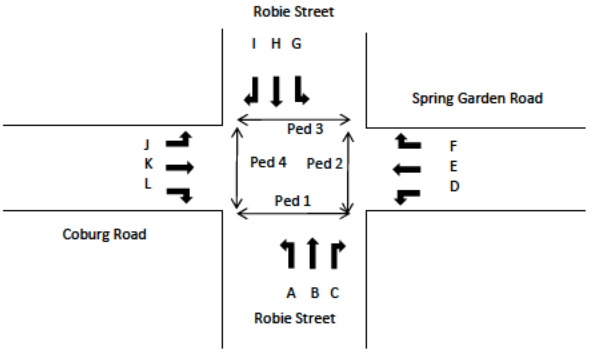
A TRAFFIC VOLUME DATA

Table A-1

Robie Street
@
Spring Garden Road/Coburg Road

Halifax, NS

Thursday, November 24, 2022



AM Peak Period Volume Data

Time		Robie Street Northbound Approach			Spring Garden Road Westbound Approach			Robie Street Southbound Approach			Coburg Road Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:30	07:45	4	101	2	7	19	16	30	176	7	11	23	3	399
07:45	08:00	7	106	9	10	15	11	42	228	10	9	17	5	469
08:00	08:15	4	132	8	15	24	25	49	248	13	8	27	5	558
08:15	08:30	14	127	13	14	30	27	38	228	8	17	39	6	561
08:30	08:45	13	153	13	16	31	27	36	201	12	10	41	10	563
08:45	09:00	6	117	7	13	35	27	49	208	18	10	27	6	523
09:00	09:15	7	113	4	12	22	23	29	131	10	17	26	4	398
09:15	09:30	8	99	6	12	25	24	31	166	9	6	30	7	423
AM Peak Hour		**37**	**529**	**41**	**58**	**120**	**106**	**172**	**885**	**51**	**45**	**134**	**27**	**2205**
07:30	**08:30**	**29**	**466**	**32**	**46**	**88**	**79**	**159**	**880**	**38**	**45**	**106**	**19**	**1987**
08:30	**09:30**	**34**	**482**	**30**	**53**	**113**	**101**	**145**	**706**	**49**	**43**	**124**	**27**	**1907**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
07:30	**08:30**	**144**			**32**			**90**			**72**			**338**
08:30	**09:30**	**126**			**49**			**130**			**70**			**375**

PM Peak Period Volume Data

Time		Robie Street Northbound Approach			Spring Garden Road Westbound Approach			Robie Street Southbound Approach			Coburg Road Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
16:00	16:15	20	194	3	9	51	38	23	104	9	18	34	7	510
16:15	16:30	20	207	7	10	51	43	28	117	10	20	24	3	540
16:30	16:45	18	197	7	16	50	31	36	89	12	20	20	7	503
16:45	17:00	25	212	9	5	43	43	24	102	12	22	22	8	527
17:00	17:15	20	200	9	10	33	38	20	109	15	13	38	7	512
17:15	17:30	8	192	9	5	42	33	28	119	13	15	41	8	513
17:30	17:45	8	194	8	8	37	30	23	117	12	29	48	7	521
17:45	18:00	9	164	14	7	21	22	21	109	12	13	29	6	427
PM Peak Hour		**83**	**816**	**32**	**41**	**177**	**155**	**108**	**417**	**49**	**75**	**104**	**25**	**2082**
16:00	**17:00**	**83**	**810**	**26**	**40**	**195**	**155**	**111**	**412**	**43**	**80**	**100**	**25**	**2080**
17:00	**18:00**	**45**	**750**	**40**	**30**	**133**	**123**	**92**	**454**	**52**	**70**	**156**	**28**	**1973**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
16:00	**17:00**	**133**			**110**			**232**			**62**			**537**
17:00	**18:00**	**136**			**38**			**168**			**63**			**405**

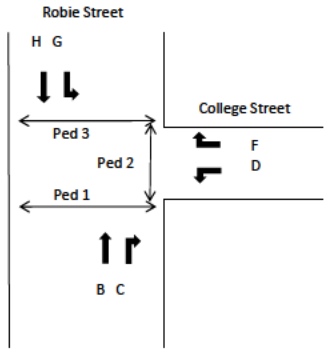
* Count provided by HRM

Table A-2

Robie Street
@
College Street

Halifax, NS

Wednesday, March 4, 2020



AM Peak Period Volume Data

Time		Robie Street Northbound Approach		College Street Westbound Approach		Robie Street Southbound Approach		Total Vehicles
		B	C	D	F	G	H	
07:00	07:15	83	0	0	3	7	151	244
07:15	07:30	83	1	1	5	3	169	262
07:30	07:45	77	3	0	12	13	218	323
07:45	08:00	95	3	0	15	17	222	352
08:00	08:15	144	7	2	7	18	247	425
08:15	08:30	106	6	5	11	22	249	399
08:30	08:45	119	5	0	12	14	235	385
08:45	09:00	129	8	1	9	17	234	398
AM Peak Hour		**498**	**26**	**8**	**39**	**71**	**965**	**1607**
07:00	**08:00**	**338**	**7**	**1**	**35**	**40**	**760**	**1181**
08:00	**09:00**	**498**	**26**	**8**	**39**	**71**	**965**	**1607**
		Ped 1		**Ped 2**		**Ped 3**		**Total Peds**
07:00	**08:00**	**5**		**30**		**4**		**39**
08:00	**09:00**	**4**		**108**		**4**		**116**

PM Peak Period Volume Data

Time		Robie Street Northbound Approach		College Street Westbound Approach		Robie Street Southbound Approach		Total Vehicles
		B	C	D	F	G	H	
15:30	15:45	217	3	5	10	5	122	362
15:45	16:00	214	5	1	19	10	107	356
16:00	16:15	246	1	2	20	7	106	382
16:15	16:30	215	2	1	13	4	90	325
16:30	16:45	213	3	3	12	5	108	344
16:45	17:00	196	3	1	11	10	104	325
17:00	17:15	186	3	2	14	9	109	323
17:15	17:30	185	5	0	16	13	116	335
PM Peak Hour		**892**	**11**	**9**	**62**	**26**	**425**	**1425**
15:30	**16:30**	**892**	**11**	**9**	**62**	**26**	**425**	**1425**
16:30	**17:30**	**780**	**14**	**6**	**53**	**37**	**437**	**1327**
		Ped 1		**Ped 2**		**Ped 3**		**Total Peds**
15:30	**16:30**	**3**		**104**		**3**		**110**
16:30	**17:30**	**3**		**102**		**9**		**114**

* Count completed by WSP

Table A-3

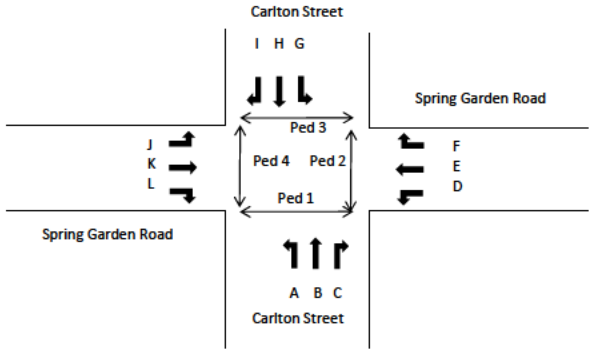
Spring Garden Road

@

Carlton Street

Halifax, NS

Tuesday, March 3, 2020



AM Peak Period Volume Data

Time		Carlton Street Northbound Approach			Spring Garden Road Westbound Approach			Carlton Street Southbound Approach			Spring Garden Road Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	0	0	1	2	31	5	2	0	0	1	26	0	68
07:15	07:30	0	1	1	4	22	5	6	0	3	0	27	5	74
07:30	07:45	2	0	3	2	46	8	0	0	2	0	42	2	107
07:45	08:00	2	0	3	4	52	5	0	0	0	1	50	1	118
08:00	08:15	3	1	6	6	85	2	2	0	3	4	50	3	165
08:15	08:30	2	0	4	6	77	6	5	0	5	4	52	3	164
08:30	08:45	5	0	4	1	54	5	7	0	2	3	63	3	147
08:45	09:00	6	0	1	5	71	7	3	2	4	2	55	4	160
AM Peak Hour		**16**	**1**	**15**	**18**	**287**	**20**	**17**	**2**	**14**	**13**	**220**	**13**	**636**
07:00	**08:00**	**4**	**1**	**8**	**12**	**151**	**23**	**8**	**0**	**5**	**2**	**145**	**8**	**367**
08:00	**09:00**	**16**	**1**	**15**	**18**	**287**	**20**	**17**	**2**	**14**	**13**	**220**	**13**	**636**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
07:00	**08:00**	**53**			**1**			**36**			**40**			**130**
08:00	**09:00**	**155**			**2**			**78**			**137**			**372**

PM Peak Period Volume Data

Time		Carlton Street Northbound Approach			Spring Garden Road Westbound Approach			Carlton Street Southbound Approach			Spring Garden Road Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
15:30	15:45	1	3	5	4	70	6	9	0	2	6	82	3	191
15:45	16:00	3	0	7	5	54	6	14	0	3	0	82	5	179
16:00	16:15	6	0	8	6	61	5	15	0	4	9	91	2	207
16:15	16:30	2	0	12	2	49	3	3	0	4	5	80	8	168
16:30	16:45	5	0	4	4	53	7	5	1	3	1	80	1	164
16:45	17:00	3	0	10	4	50	9	7	0	2	3	92	7	187
17:00	17:15	1	0	10	1	49	4	8	0	1	4	79	2	159
17:15	17:30	3	0	1	3	54	2	5	0	4	4	63	4	143
PM Peak Hour		**12**	**3**	**32**	**17**	**234**	**20**	**41**	**0**	**13**	**20**	**335**	**18**	**745**
15:30	**16:30**	**12**	**3**	**32**	**17**	**234**	**20**	**41**	**0**	**13**	**20**	**335**	**18**	**745**
16:30	**17:30**	**12**	**0**	**25**	**12**	**206**	**22**	**25**	**1**	**10**	**12**	**314**	**14**	**653**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
15:30	**16:30**	**267**			**16**			**191**			**207**			**681**
16:30	**17:30**	**205**			**6**			**161**			**119**			**491**

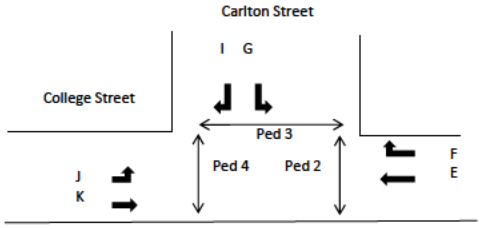
* Count completed by WSP

Table A-4

College Street
@
Carlton Street

Halifax, NS

Tuesday, March 3, 2020



AM Peak Period Volume Data

Time		College Street Westbound Approach		Carlton Street Southbound Approach		College Street Eastbound Approach		Total Vehicles
		E	F	G	I	J	K	
07:00	07:15	3	0	2	3	2	8	18
07:15	07:30	3	2	3	0	3	5	16
07:30	07:45	9	1	7	1	1	2	21
07:45	08:00	7	0	2	5	0	17	31
08:00	08:15	10	1	5	2	2	13	33
08:15	08:30	10	5	7	3	5	16	46
08:30	08:45	6	5	2	3	6	22	44
08:45	09:00	7	3	5	4	6	13	38
AM Peak Hour		**33**	**14**	**19**	**12**	**19**	**64**	**161**
07:00	**08:00**	**22**	**3**	**14**	**9**	**6**	**32**	**86**
08:00	**09:00**	**33**	**14**	**19**	**12**	**19**	**64**	**161**
		Ped 2		**Ped 3**		**Ped 4**		**Total Peds**
07:00	**08:00**	**42**		**14**		**25**		**81**
08:00	**09:00**	**121**		**13**		**66**		**200**

PM Peak Period Volume Data

Time		College Street Westbound Approach		Carlton Street Southbound Approach		College Street Eastbound Approach		Total Vehicles
		E	F	G	I	J	K	
15:30	15:45	18	7	7	6	2	6	46
15:45	16:00	17	9	3	2	4	6	41
16:00	16:15	11	15	9	3	6	9	53
16:15	16:30	11	4	3	4	2	8	32
16:30	16:45	10	4	3	2	4	7	30
16:45	17:00	10	5	3	6	2	4	30
17:00	17:15	16	2	2	5	9	7	41
17:15	17:30	14	2	1	1	3	6	27
PM Peak Hour		**57**	**35**	**22**	**15**	**14**	**29**	**172**
15:30	**16:30**	**57**	**35**	**22**	**15**	**14**	**29**	**172**
16:30	**17:30**	**50**	**13**	**9**	**14**	**18**	**24**	**128**
		Ped 2		**Ped 3**		**Ped 4**		**Total Peds**
15:30	**16:30**	**133**		**23**		**76**		**232**
16:30	**17:30**	**90**		**24**		**52**		**166**

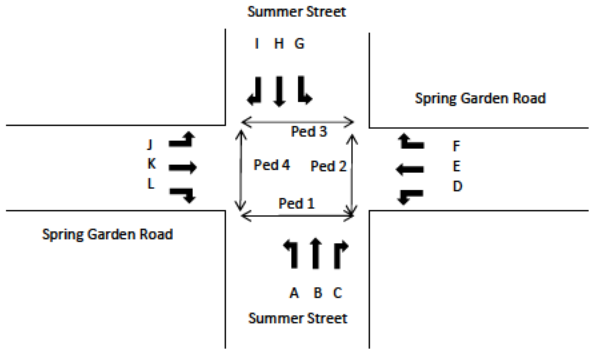
* Count completed by WSP

Table A-5

Spring Garden Road
@
Summer Street

Halifax, NS

Tuesday, March 3, 2020



AM Peak Period Volume Data

Time		Summer Street Northbound Approach			Spring Garden Road Westbound Approach			Summer Street Southbound Approach			Spring Garden Road Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	1	43	1	0	15	8	7	58	11	1	22	4	171
07:15	07:30	2	29	0	1	13	11	13	60	18	4	19	3	173
07:30	07:45	4	30	1	1	19	5	20	64	23	3	34	3	207
07:45	08:00	2	27	3	1	25	11	38	72	36	2	38	4	259
08:00	08:15	4	48	7	2	26	10	38	79	29	8	59	8	318
08:15	08:30	9	40	9	1	17	17	34	53	34	8	65	6	293
08:30	08:45	10	50	4	1	30	14	22	64	33	10	37	2	277
08:45	09:00	6	39	4	4	24	9	23	61	28	22	38	5	263
AM Peak Hour		**29**	**177**	**24**	**8**	**97**	**50**	**117**	**257**	**124**	**48**	**199**	**21**	**1151**
07:00	**08:00**	**9**	**129**	**5**	**3**	**72**	**35**	**78**	**254**	**88**	**10**	**113**	**14**	**810**
08:00	**09:00**	**29**	**177**	**24**	**8**	**97**	**50**	**117**	**257**	**124**	**48**	**199**	**21**	**1151**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
07:00	**08:00**	**59**			**93**			**69**			**98**			**319**
08:00	**09:00**	**118**			**110**			**141**			**107**			**476**

PM Peak Period Volume Data

Time		Summer Street Northbound Approach			Spring Garden Road Westbound Approach			Summer Street Southbound Approach			Spring Garden Road Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
15:30	15:45	15	77	5	2	41	15	19	33	24	10	43	8	292
15:45	16:00	12	81	2	1	47	14	16	38	25	17	43	5	301
16:00	16:15	18	97	5	2	41	10	16	21	27	15	44	8	304
16:15	16:30	16	72	4	3	42	7	13	39	30	11	41	4	282
16:30	16:45	13	97	1	2	42	20	15	36	25	13	43	3	310
16:45	17:00	13	92	0	2	51	11	16	32	31	10	46	5	309
17:00	17:15	9	65	2	1	37	10	16	40	27	10	38	4	259
17:15	17:30	7	54	2	3	40	17	10	45	21	8	49	4	260
PM Peak Hour		**60**	**358**	**10**	**9**	**176**	**48**	**60**	**128**	**113**	**49**	**174**	**20**	**1205**
15:30	**16:30**	**61**	**327**	**16**	**8**	**171**	**46**	**64**	**131**	**106**	**53**	**171**	**25**	**1179**
16:30	**17:30**	**42**	**308**	**5**	**8**	**170**	**58**	**57**	**153**	**104**	**41**	**176**	**16**	**1138**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
15:30	**16:30**	**220**			**172**			**195**			**118**			**705**
16:30	**17:30**	**185**			**101**			**208**			**121**			**615**

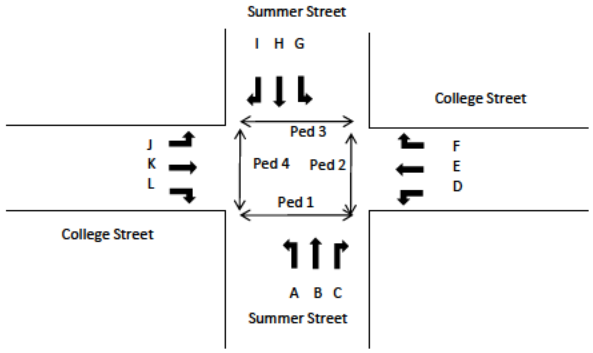
* Count completed by WSP

Table A-6

College Street
@
Summer Street

Halifax, NS

Tuesday, March 3, 2020



AM Peak Period Volume Data

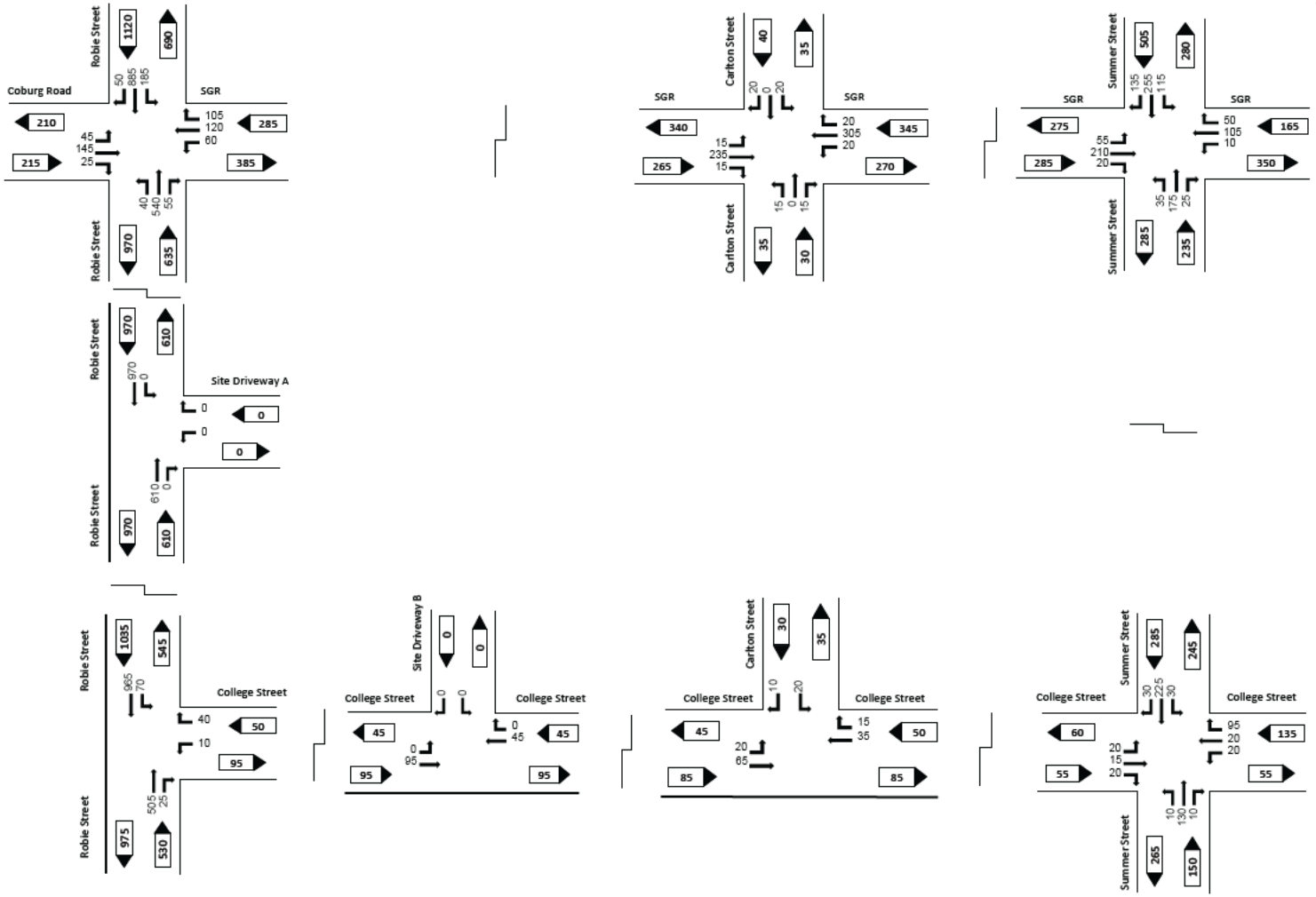
Time		Summer Street Northbound Approach			College Street Westbound Approach			Summer Street Southbound Approach			College Street Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	2	38	1	4	3	4	12	49	1	1	2	3	120
07:15	07:30	1	28	1	1	0	2	8	51	2	3	0	2	99
07:30	07:45	1	27	0	0	4	5	10	53	7	3	2	3	115
07:45	08:00	4	19	0	3	1	10	9	55	8	0	6	9	124
08:00	08:15	3	28	2	3	8	23	8	70	8	8	7	2	170
08:15	08:30	2	26	4	8	6	31	9	37	6	4	3	9	145
08:30	08:45	1	35	2	3	3	27	8	57	10	3	4	8	161
08:45	09:00	2	34	2	4	2	14	6	59	6	6	2	3	140
AM Peak Hour		**8**	**123**	**10**	**18**	**19**	**95**	**31**	**223**	**30**	**21**	**16**	**22**	**616**
07:00	**08:00**	**8**	**112**	**2**	**8**	**8**	**21**	**39**	**208**	**18**	**7**	**10**	**17**	**458**
08:00	**09:00**	**8**	**123**	**10**	**18**	**19**	**95**	**31**	**223**	**30**	**21**	**16**	**22**	**616**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
07:00	**08:00**	**19**			**138**			**68**			**127**			**352**
08:00	**09:00**	**43**			**86**			**170**			**183**			**482**

PM Peak Period Volume Data

Time		Summer Street Northbound Approach			College Street Westbound Approach			Summer Street Southbound Approach			College Street Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
15:30	15:45	3	80	3	0	8	27	2	34	7	5	0	6	175
15:45	16:00	3	80	1	1	11	20	5	39	5	2	6	5	178
16:00	16:15	8	85	1	1	5	15	5	29	1	7	3	6	166
16:15	16:30	4	76	1	0	3	21	8	29	5	7	9	0	163
16:30	16:45	2	98	0	1	4	17	8	30	2	4	3	8	177
16:45	17:00	3	78	1	0	4	29	3	30	2	6	1	2	159
17:00	17:15	2	56	1	2	8	15	7	35	4	5	2	6	143
17:15	17:30	4	43	2	4	6	23	9	38	6	1	3	7	146
PM Peak Hour		**17**	**339**	**3**	**3**	**23**	**73**	**26**	**127**	**13**	**20**	**21**	**19**	**684**
15:30	**16:30**	**18**	**321**	**6**	**2**	**27**	**83**	**20**	**131**	**18**	**21**	**18**	**17**	**682**
16:30	**17:30**	**11**	**275**	**4**	**7**	**22**	**84**	**27**	**133**	**14**	**16**	**9**	**23**	**625**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
15:30	**16:30**	**36**			**146**			**185**			**275**			**642**
16:30	**17:30**	**35**			**67**			**108**			**180**			**390**

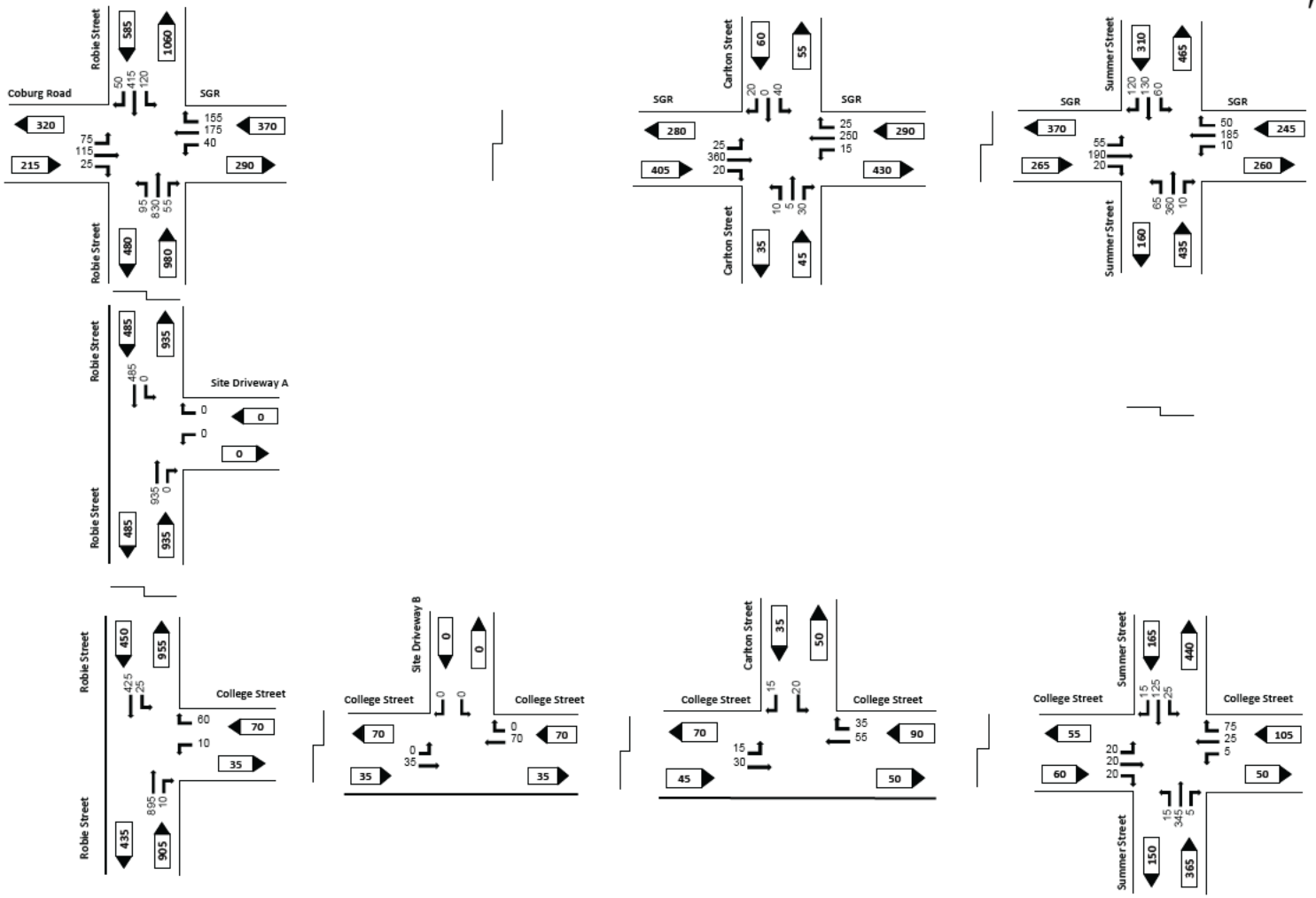
* Count completed by WSP

Weekday AM Peak Hour
2033 Future Background Traffic Volumes



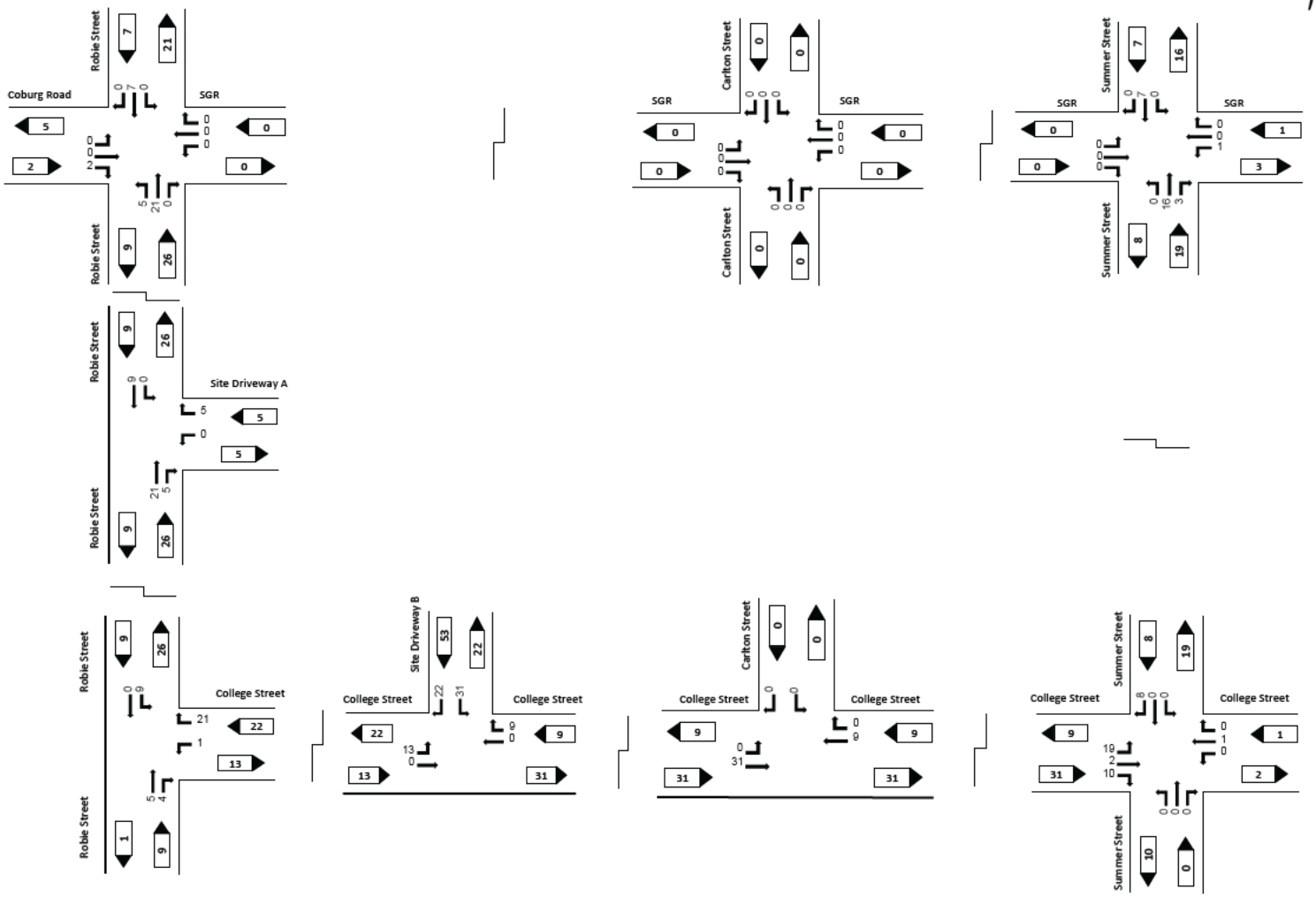
wsp	The Promenade Halifax, NS	Figure A-1A
	Weekday AM Peak Hour 2033 Future Background Traffic Volumes	November 2024

Weekday PM Peak Hour
2033 Future Background Traffic Volumes



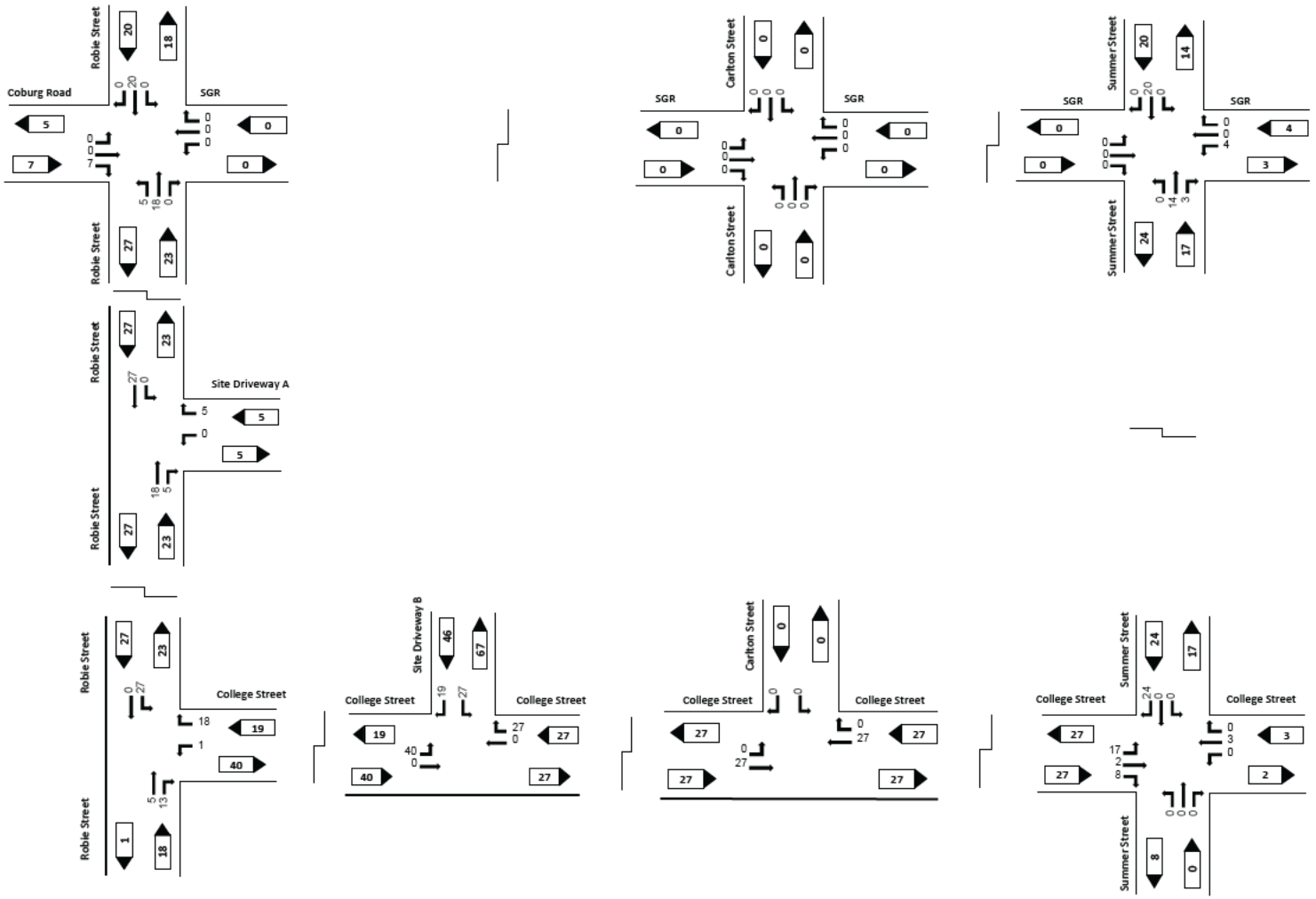
wsp	The Promenade Halifax, NS	Figure A-1B
	Weekday PM Peak Hour 2033 Future Background Traffic Volumes	November 2024

Weekday AM Peak Hour
Trips Generated by Subject Site



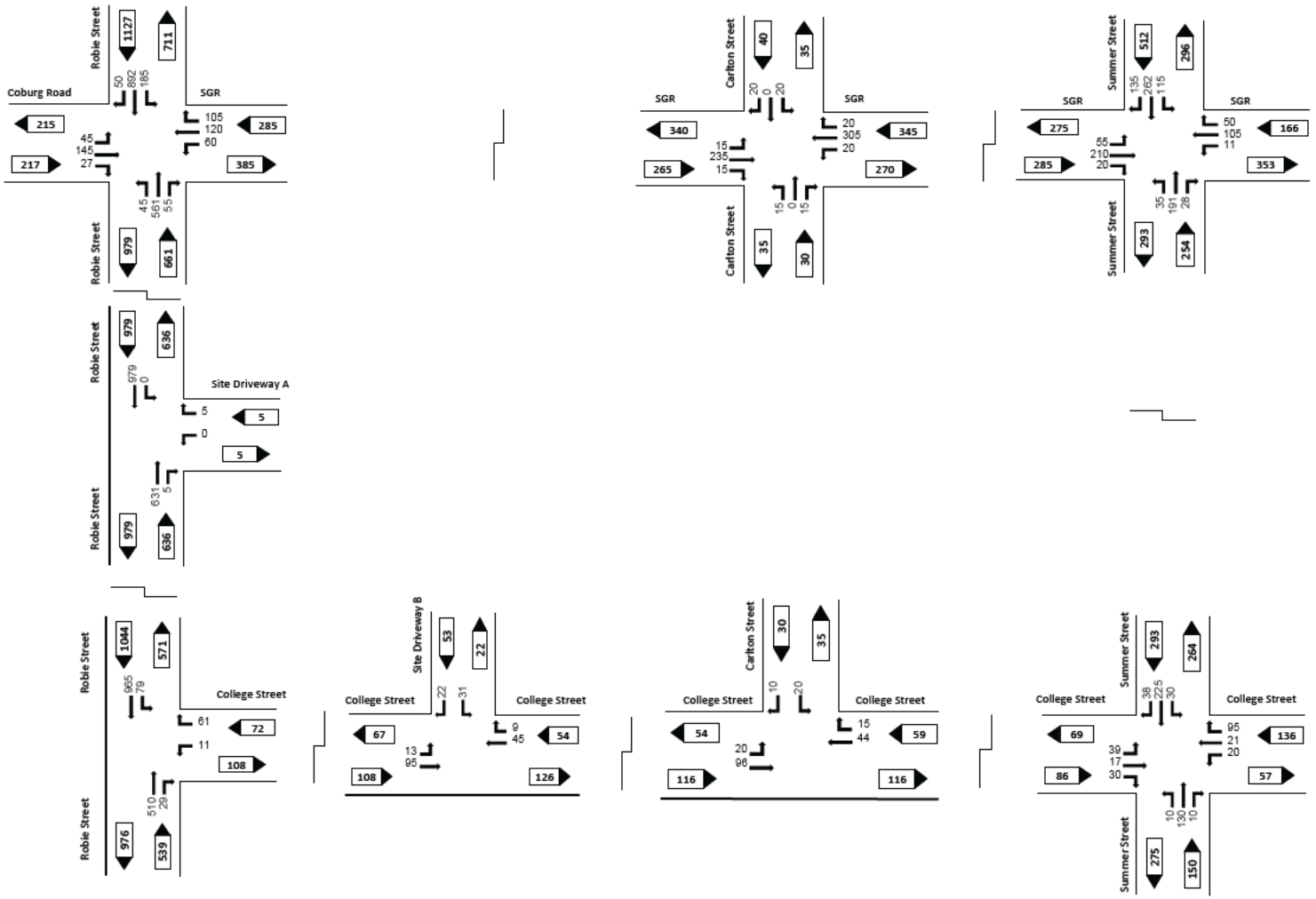
WSP	The Promenade Halifax, NS	Figure A-2A
	Weekday AM Peak Hour Trips Generated by Subject Site	November 2024

Weekday PM Peak Hour
Trips Generated by Subject Site



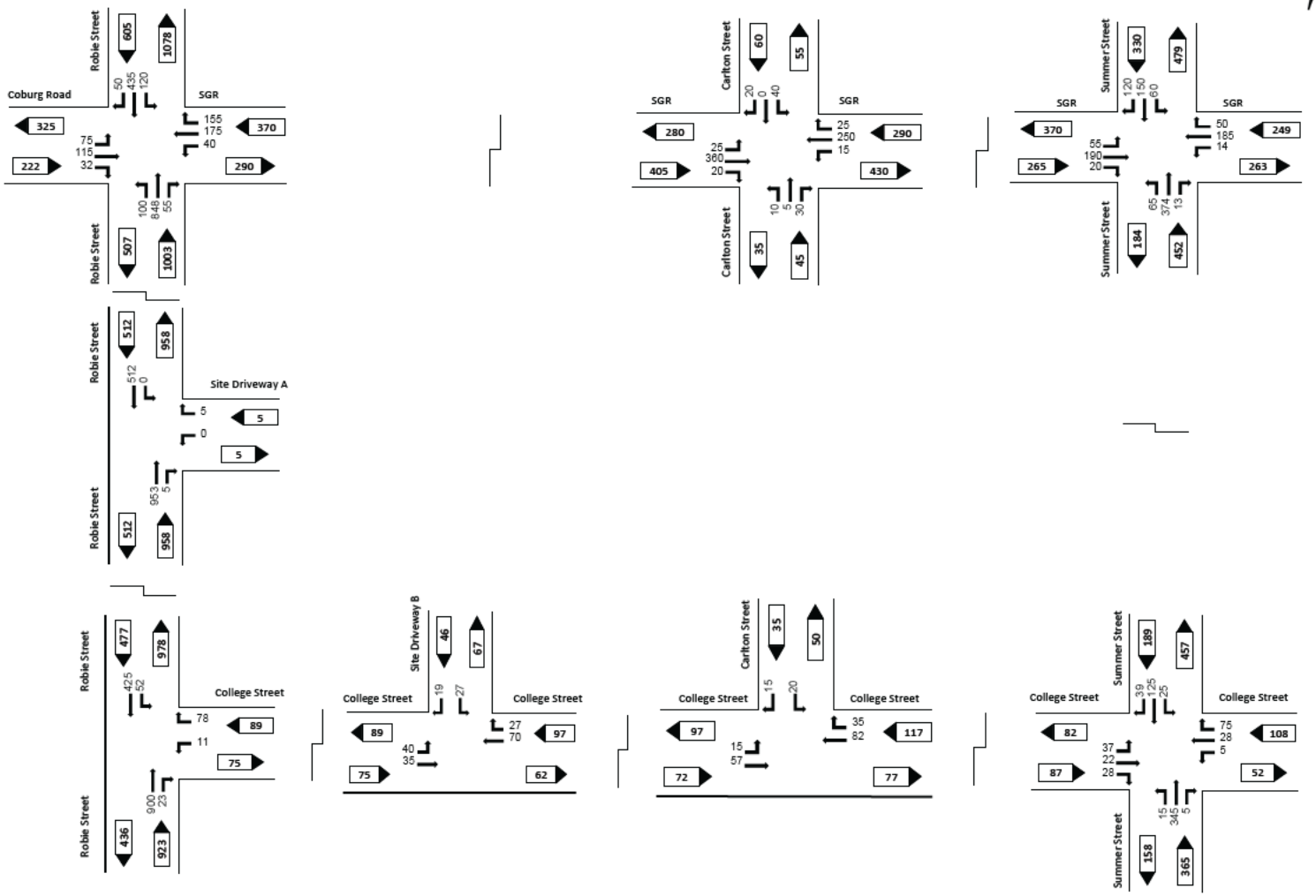
WSP	The Promenade Halifax, NS	Figure A-2B
	Weekday PM Peak Hour Trips Generated by Subject Site	November 2024

Weekday AM Peak Hour
2033 Total Traffic with Site Generated Trips



wsp	The Promenade Halifax, NS	Figure A-3A
	Weekday AM Peak Hour 2033 Total Traffic with Site Generated Trips	November 2024

Weekday PM Peak Hour
2033 Total Traffic with Site Generated Trips



wsp	The Promenade Halifax, NS	Figure A-3B
	Weekday PM Peak Hour 2033 Total Traffic with Site Generated Trips	November 2024

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Case 20218	**Organization:**	WSP
Project Location:	Halifax, Nova Scotia	**Performed By:**	Fariba Hossain
Scenario Description:	AM Peak Hour	**Date:**	2024-09-16
Analysis Year:	2033	**Checked By:**	Patrick Hatton
Analysis Period:	**AM Street Peak Hour**	**Date:**	2024-09-18

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				109	96	13
Retail				0	0	0
Restaurant				0		
Cinema/Entertainment				0		
Residential				74	19	55
Hotel				0		
All Other Land Uses[2]				0		
				183	115	68

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail	1.17			1.16		
Restaurant						
Cinema/Entertainment						
Residential	1.13			1.09		
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	190	117	73
Internal Capture Percentage	1%	1%	1%
External Vehicle-Trips[5]	181	114	67
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	1%	0%
Retail	N/A	N/A
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	0%	2%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Case 20218	**Organization:**	WSP
Project Location:	Halifax, Nova Scotia	**Performed By:**	Fariba Hossain
Scenario Description:	PM Peak Hour	**Date:**	2024-09-16
Analysis Year:	2033	**Checked By:**	Patrick Hatton
Analysis Period:	**PM Street Peak Hour**	**Date:**	2024-09-18

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				110	19	91
Retail				0	0	0
Restaurant				0		
Cinema/Entertainment				0		
Residential				88	55	33
Hotel				0		
All Other Land Uses[2]				0		
				198	74	124

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail	1.21			1.18		
Restaurant						
Cinema/Entertainment						
Residential	1.15			1.21		
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					1000	
Restaurant						
Cinema/Entertainment						
Residential		1000				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	2	0
Retail	0		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	213	82	131
Internal Capture Percentage	4%	5%	3%
External Vehicle-Trips[5]	190	70	120
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	11%	2%
Retail	N/A	N/A
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	3%	5%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.
[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.
[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).
[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be
[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.
[6]Person-Trips
*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	The Promenade	**Organization:**	WSP
Project Location:	Halifax, Nova Scotia	**Performed By:**	Fariba Hossain
Scenario Description:	AM Peak Hour	**Date:**	2024-11-08
Analysis Year:	2033	**Checked By:**	Patrick Hatton
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				15	9	6
Restaurant				0		
Cinema/Entertainment				0		
Residential				211	54	157
Hotel				0		
All Other Land Uses[2]				0		
				226	63	163

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail	1.17			1.16		
Restaurant						
Cinema/Entertainment						
Residential	1.13			1.09		
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	2	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	250	72	178
Internal Capture Percentage	2%	4%	2%
External Vehicle-Trips[5]	221	61	160
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	18%	14%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	1%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	The Promenade	**Organization:**	WSP
Project Location:	Halifax, Nova Scotia	**Performed By:**	Fariba Hossain
Scenario Description:	PM Peak Hour	**Date:**	2024-11-08
Analysis Year:	2033	**Checked By:**	Patrick Hatton
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				45	22	23
Restaurant				0		
Cinema/Entertainment				0		
Residential				265	164	101
Hotel				0		
All Other Land Uses[2]				0		
				310	186	124

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail	1.21			1.18		
Restaurant						
Cinema/Entertainment						
Residential	1.15			1.21		
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					1000	
Restaurant						
Cinema/Entertainment						
Residential		1000				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	7	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	2	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	365	216	149
Internal Capture Percentage	5%	4%	6%
External Vehicle-Trips[5]	295	179	116
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	7%	26%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	4%	2%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.
[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.
[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).
[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be
[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.
[6]Person-Trips
*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

APPENDIX

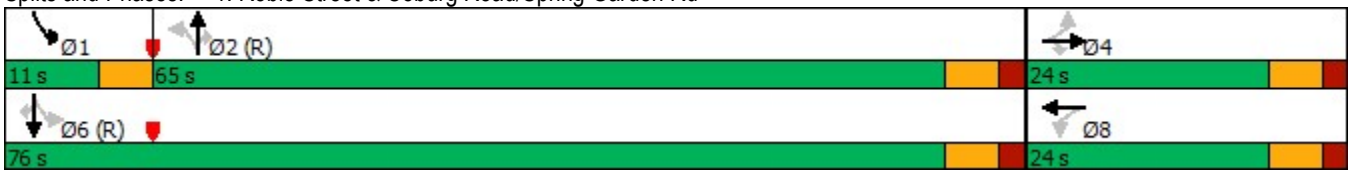
B

INTERSECTION PERFORMANCE ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	145	25	60	120	105	40	540	55	185	885	50
Future Volume (vph)	45	145	25	60	120	105	40	540	55	185	885	50
Satd. Flow (prot)	1770	1863	1583	0	3027	0	0	3529	1583	0	3507	1583
Flt Permitted	0.452				0.775			0.797			0.703	
Satd. Flow (perm)	728	1863	1138	0	2266	0	0	2816	1293	0	2465	1357
Satd. Flow (RTOR)			76		103				76			54
Lane Group Flow (vph)	50	161	28	0	317	0	0	644	61	0	1189	56
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Total Split (s)	24.0	24.0	24.0	24.0	24.0		65.0	65.0	65.0	11.0	76.0	76.0
Total Lost Time (s)	6.0	6.0	6.0		6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)	14.3	14.3	14.3		14.3			73.7	73.7		73.7	73.7
Actuated g/C Ratio	0.14	0.14	0.14		0.14			0.74	0.74		0.74	0.74
v/c Ratio	0.49	0.61	0.12		0.77			0.31	0.06		0.65	0.06
Control Delay	54.2	49.5	1.1		40.3			5.3	0.9		9.4	1.5
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay	54.2	49.5	1.1		40.3			5.3	0.9		9.4	1.5
LOS	D	D	A		D			A	A		A	A
Approach Delay		44.8			40.3			4.9			9.0	
Approach LOS		D			D			A			A	
Queue Length 50th (m)	9.5	31.0	0.0		22.2			20.3	0.0		56.0	0.1
Queue Length 95th (m)	21.4	50.4	0.0		36.7			31.6	2.7		87.6	3.5
Internal Link Dist (m)		203.2			123.0			104.5			218.9	
Turn Bay Length (m)	19.0								41.0			41.0
Base Capacity (vph)	131	335	267		492			2076	973		1817	1014
Starvation Cap Reductn	0	0	0		0			0	0		0	0
Spillback Cap Reductn	0	0	0		0			0	0		0	0
Storage Cap Reductn	0	0	0		0			0	0		0	0
Reduced v/c Ratio	0.38	0.48	0.10		0.64			0.31	0.06		0.65	0.06

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 95.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Robie Street & Coburg Road/Spring Garden Rd

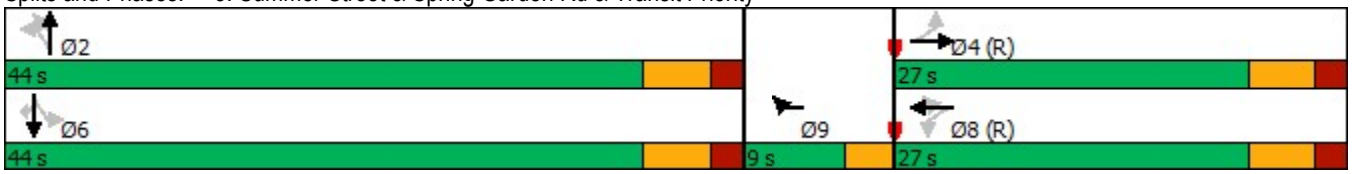


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	55	210	20	10	95	10	50	35	175	25	115	255
Future Volume (vph)	55	210	20	10	95	10	50	35	175	25	115	255
Satd. Flow (prot)	0	3390	0	0	1853	1368	0	0	1791	0	0	1835
Flt Permitted		0.873			0.960				0.823			0.774
Satd. Flow (perm)	0	2815	0	0	1755	864	0	0	1457	0	0	1397
Satd. Flow (RTOR)		9				56			10			
Lane Group Flow (vph)	0	316	0	0	117	67	0	0	261	0	0	411
Turn Type	Perm	NA		Perm	NA	custom		Perm	NA		Perm	NA
Protected Phases		4			8	9			2			6
Permitted Phases	4			8		8		2			6	
Total Split (s)	27.0	27.0		27.0	27.0	9.0		44.0	44.0		44.0	44.0
Total Lost Time (s)		6.0			6.0	3.0			6.0			6.0
Act Effct Green (s)		32.2			32.2	40.2			28.4			28.4
Actuated g/C Ratio		0.40			0.40	0.50			0.36			0.36
v/c Ratio		0.28			0.17	0.13			0.50			0.83
Control Delay		19.3			20.1	5.6			21.5			37.4
Queue Delay		0.0			0.0	0.0			0.0			0.0
Total Delay		19.3			20.1	5.6			21.5			37.4
LOS		B			C	A			C			D
Approach Delay		19.3			14.9				21.5			32.8
Approach LOS		B			B				C			C
Queue Length 50th (m)		17.5			12.1	0.8			30.7			58.8
Queue Length 95th (m)		33.4			28.4	8.1			42.9			79.0
Internal Link Dist (m)		122.4			102.8				99.4			98.4
Turn Bay Length (m)						35.0						
Base Capacity (vph)		1139			706	503			697			663
Starvation Cap Reductn		0			0	0			0			0
Spillback Cap Reductn		0			0	0			0			0
Storage Cap Reductn		0			0	0			0			0
Reduced v/c Ratio		0.28			0.17	0.13			0.37			0.62

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 24.8 — Intersection LOS: C
Intersection Capacity Utilization 71.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Summer Street & Spring Garden Rd & Transit Priority



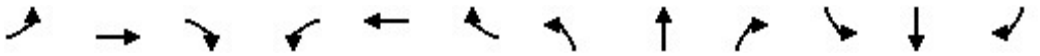
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1138
Satd. Flow (RTOR)	
Lane Group Flow (vph)	150
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Total Split (s)	44.0
Total Lost Time (s)	6.0
Act Effct Green (s)	28.4
Actuated g/C Ratio	0.36
v/c Ratio	0.37
Control Delay	20.2
Queue Delay	0.0
Total Delay	20.2
LOS	C
Approach Delay	
Approach LOS	
Queue Length 50th (m)	17.5
Queue Length 95th (m)	27.1
Internal Link Dist (m)	
Turn Bay Length (m)	23.0
Base Capacity (vph)	540
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.28

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	40	505	25	70	965
Future Volume (Veh/h)	10	40	505	25	70	965
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	44	561	28	78	1072
Pedestrians	120		10			5
Lane Width (m)	3.6		3.6			3.6
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	10		1			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						129
pX, platoon unblocked	0.88					
vC, conflicting volume	1397	420			709	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1180	420			709	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	92			90	
cM capacity (veh/h)	130	522			797	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	55	374	215	435	715
Volume Left	11	0	0	78	0
Volume Right	44	0	28	0	0
cSH	325	1700	1700	797	1700
Volume to Capacity	0.17	0.22	0.13	0.10	0.42
Queue Length 95th (m)	4.8	0.0	0.0	2.6	0.0
Control Delay (s)	18.3	0.0	0.0	2.8	0.0
Lane LOS	C			A	
Approach Delay (s)	18.3	0.0		1.1	
Approach LOS	C				

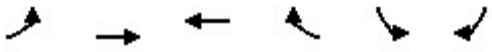
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	235	15	20	305	20	15	0	15	20	0	20
Future Volume (Veh/h)	15	235	15	20	305	20	15	0	15	20	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	261	17	22	339	22	17	0	17	22	0	22
Pedestrians		155			5			170			95	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		13			0			14			8	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		147			146							
pX, platoon unblocked	1.00			0.97			0.97	0.97	0.97	0.97	0.97	1.00
vC, conflicting volume	456			448			1044	974	444	814	971	600
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	453			411			1023	950	407	786	947	598
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			98			86	100	97	90	100	95
cM capacity (veh/h)	1017			952			119	191	532	217	192	402

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	295	383	34	44
Volume Left	17	22	17	22
Volume Right	17	22	17	22
cSH	1017	952	195	282
Volume to Capacity	0.02	0.02	0.17	0.16
Queue Length 95th (m)	0.4	0.6	4.9	4.4
Control Delay (s)	0.7	0.8	27.4	20.1
Lane LOS	A	A	D	C
Approach Delay (s)	0.7	0.8	27.4	20.1
Approach LOS			D	C

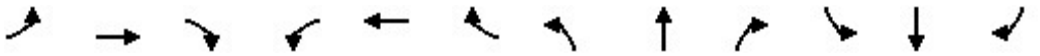
Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	43.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	65	35	15	20	10
Future Volume (Veh/h)	20	65	35	15	20	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	72	39	17	22	11
Pedestrians		75	130		20	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		6	11		2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	76				314	142
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76				314	142
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	99
cM capacity (veh/h)	1498				587	834

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	94	56	33
Volume Left	22	0	22
Volume Right	0	17	11
cSH	1498	1700	651
Volume to Capacity	0.01	0.03	0.05
Queue Length 95th (m)	0.4	0.0	1.3
Control Delay (s)	1.8	0.0	10.8
Lane LOS	A		B
Approach Delay (s)	1.8	0.0	10.8
Approach LOS			B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	15	20	20	20	95	10	130	10	30	225	30
Future Volume (Veh/h)	20	15	20	20	20	95	10	130	10	30	225	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	17	22	22	22	106	11	144	11	33	250	33
Pedestrians		200			155			55			190	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		17			13			5			16	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											123	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1011	864	522	744	876	494	483			310		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	932	762	364	623	775	494	319			310		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	92	95	89	89	75	99			97		
cM capacity (veh/h)	78	200	466	195	197	421	891			1089		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	61	150	166	316
Volume Left	22	22	11	33
Volume Right	22	106	11	33
cSH	148	315	891	1089
Volume to Capacity	0.41	0.48	0.01	0.03
Queue Length 95th (m)	14.5	19.5	0.3	0.7
Control Delay (s)	45.5	26.4	0.7	1.2
Lane LOS	E	D	A	A
Approach Delay (s)	45.5	26.4	0.7	1.2
Approach LOS	E	D		

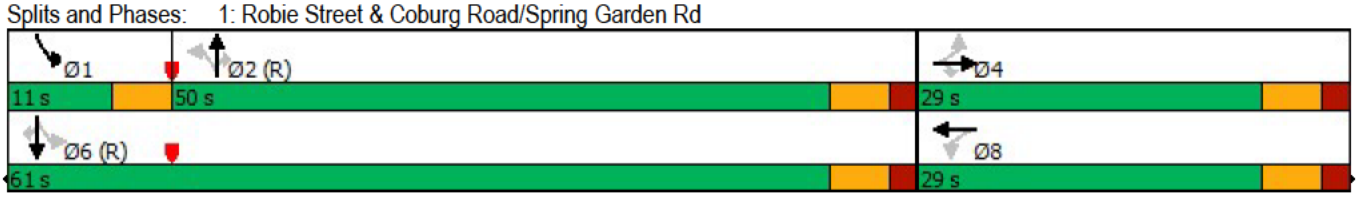
Intersection Summary				
Average Delay	10.4			
Intersection Capacity Utilization	44.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	115	25	40	175	155	95	830	55	120	415	50
Future Volume (vph)	75	115	25	40	175	155	95	830	55	120	415	50
Satd. Flow (prot)	1770	1863	1583	0	2856	0	0	3522	1583	0	3500	1583
Flt Permitted	0.380				0.898			0.801			0.587	
Satd. Flow (perm)	593	1863	1204	0	2524	0	0	2821	1067	0	2060	1390
Satd. Flow (RTOR)			85		172				85			36
Lane Group Flow (vph)	83	128	28	0	410	0	0	1028	61	0	594	56
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Total Split (s)	29.0	29.0	29.0	29.0	29.0		50.0	50.0	50.0	11.0	61.0	61.0
Total Lost Time (s)	6.0	6.0	6.0		6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)	15.9	15.9	15.9		15.9			62.1	62.1		62.1	62.1
Actuated g/C Ratio	0.18	0.18	0.18		0.18			0.69	0.69		0.69	0.69
v/c Ratio	0.80	0.39	0.10		0.70			0.53	0.08		0.42	0.06
Control Delay	80.1	34.6	0.7		25.7			8.9	1.1		8.1	3.4
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay	80.1	34.6	0.7		25.7			8.9	1.1		8.1	3.4
LOS	F	C	A		C			A	A		A	A
Approach Delay		46.4			25.7			8.5			7.7	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	14.6	20.8	0.0		21.1			41.8	0.0		21.5	1.0
Queue Length 95th (m)	#32.2	34.0	0.0		33.8			73.6	2.9		41.1	5.9
Internal Link Dist (m)		203.2			123.0			104.5			218.9	
Turn Bay Length (m)	19.0								41.0			41.0
Base Capacity (vph)	151	476	370		773			1947	763		1422	970
Starvation Cap Reductn	0	0	0		0			0	0		0	0
Spillback Cap Reductn	0	0	0		0			0	0		0	0
Storage Cap Reductn	0	0	0		0			0	0		0	0
Reduced v/c Ratio	0.55	0.27	0.08		0.53			0.53	0.08		0.42	0.06

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 15.0 Intersection LOS: B
Intersection Capacity Utilization 90.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

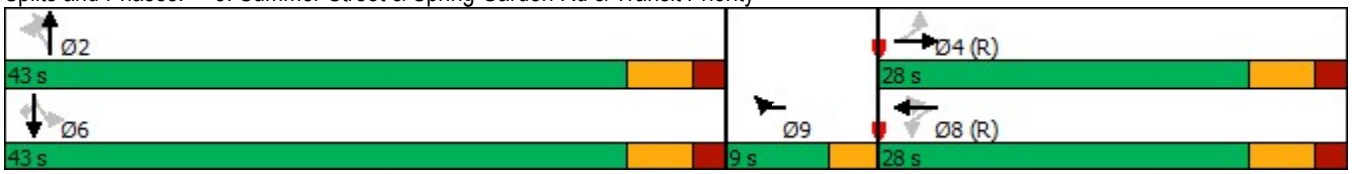
Splits and Phases: 1: Robie Street & Coburg Road/Spring Garden Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	55	190	20	10	170	15	50	65	360	10	60	130
Future Volume (vph)	55	190	20	10	170	15	50	65	360	10	60	130
Satd. Flow (prot)	0	3331	0	0	1857	1583	0	0	1837	0	0	1833
Flt Permitted		0.848			0.977				0.914			0.702
Satd. Flow (perm)	0	2636	0	0	1786	772	0	0	1635	0	0	1283
Satd. Flow (RTOR)		10				56			2			
Lane Group Flow (vph)	0	294	0	0	200	73	0	0	483	0	0	211
Turn Type	Perm	NA		Perm	NA	custom		Perm	NA		Perm	NA
Protected Phases		4			8	9			2			6
Permitted Phases	4			8		8		2			6	
Total Split (s)	28.0	28.0		28.0	28.0	9.0		43.0	43.0		43.0	43.0
Total Lost Time (s)		6.0			6.0	3.0			6.0			6.0
Act Effct Green (s)		31.7			31.7	39.5			29.1			29.1
Actuated g/C Ratio		0.40			0.40	0.49			0.36			0.36
v/c Ratio		0.28			0.28	0.16			0.81			0.45
Control Delay		19.4			21.0	6.1			33.6			21.4
Queue Delay		0.0			0.0	0.0			0.0			0.0
Total Delay		19.4			21.0	6.1			33.6			21.4
LOS		B			C	A			C			C
Approach Delay		19.4			17.0				33.6			20.6
Approach LOS		B			B				C			C
Queue Length 50th (m)		16.5			22.3	1.3			67.3			24.9
Queue Length 95th (m)		30.8			45.0	8.9			89.3			37.2
Internal Link Dist (m)		122.4			102.8				99.4			98.4
Turn Bay Length (m)						35.0						
Base Capacity (vph)		1049			706	473			757			593
Starvation Cap Reductn		0			0	0			0			0
Spillback Cap Reductn		0			0	0			0			0
Storage Cap Reductn		0			0	0			0			0
Reduced v/c Ratio		0.28			0.28	0.15			0.64			0.36

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 88.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Summer Street & Spring Garden Rd & Transit Priority



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	120
Future Volume (vph)	120
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1086
Satd. Flow (RTOR)	
Lane Group Flow (vph)	133
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Total Split (s)	43.0
Total Lost Time (s)	6.0
Act Effct Green (s)	29.1
Actuated g/C Ratio	0.36
v/c Ratio	0.34
Control Delay	19.3
Queue Delay	0.0
Total Delay	19.3
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (m)	15.0
Queue Length 95th (m)	24.6
Internal Link Dist (m)	
Turn Bay Length (m)	23.0
Base Capacity (vph)	502
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.26

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	60	895	10	25	425
Future Volume (Veh/h)	10	60	895	10	25	425
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	67	994	11	28	472
Pedestrians	120		10			15
Lane Width (m)	3.6		3.6			3.6
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	10		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						129
pX, platoon unblocked	0.98					
vC, conflicting volume	1422	638			1125	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1393	638			1125	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	82			95	
cM capacity (veh/h)	111	373			555	

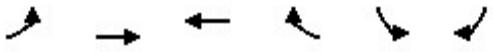
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	78	663	342	185	315
Volume Left	11	0	0	28	0
Volume Right	67	0	11	0	0
cSH	279	1700	1700	555	1700
Volume to Capacity	0.28	0.39	0.20	0.05	0.19
Queue Length 95th (m)	8.9	0.0	0.0	1.3	0.0
Control Delay (s)	22.8	0.0	0.0	2.3	0.0
Lane LOS	C			A	
Approach Delay (s)	22.8	0.0		0.9	
Approach LOS	C				

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	360	20	15	250	25	10	5	30	40	0	20
Future Volume (Veh/h)	25	360	20	15	250	25	10	5	30	40	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	400	22	17	278	28	11	6	33	44	0	22
Pedestrians		230			25			290			220	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		19			2			24			18	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		147			146							
pX, platoon unblocked	0.97			0.95			0.97	0.97	0.95	0.97	0.97	0.97
vC, conflicting volume	526			712			1335	1317	726	1074	1314	742
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	496			673			1259	1240	687	989	1237	718
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			97			80	94	90	56	100	92
cM capacity (veh/h)	846			663			54	99	316	101	99	275

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	450	323	50	66
Volume Left	28	17	11	44
Volume Right	22	28	33	22
cSH	846	663	136	128
Volume to Capacity	0.03	0.03	0.37	0.52
Queue Length 95th (m)	0.8	0.6	12.2	19.5
Control Delay (s)	1.0	0.9	46.1	59.8
Lane LOS	A	A	E	F
Approach Delay (s)	1.0	0.9	46.1	59.8
Approach LOS			E	F

Intersection Summary				
Average Delay	7.8			
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	30	55	35	20	15
Future Volume (Veh/h)	15	30	55	35	20	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	33	61	39	22	17
Pedestrians		95	145		35	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		8	12		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	135				328	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135				328	210
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	98
cM capacity (veh/h)	1407				562	742

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	50	100	39
Volume Left	17	0	22
Volume Right	0	39	17
cSH	1407	1700	629
Volume to Capacity	0.01	0.06	0.06
Queue Length 95th (m)	0.3	0.0	1.6
Control Delay (s)	2.6	0.0	11.1
Lane LOS	A		B
Approach Delay (s)	2.6	0.0	11.1
Approach LOS			B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	20	20	5	25	75	15	345	5	25	125	15
Future Volume (Veh/h)	20	20	20	5	25	75	15	345	5	25	125	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	22	22	6	28	83	17	383	6	28	139	17
Pedestrians		205			105			40			190	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		17			9			3			16	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											123	
pX, platoon unblocked	0.97	0.97	0.97	0.97	0.97		0.97					
vC, conflicting volume	1116	936	392	802	942	681	361			494		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1105	921	362	782	927	681	330			494		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	68	88	96	97	85	76	98			97		
cM capacity (veh/h)	68	190	533	184	189	346	992			976		

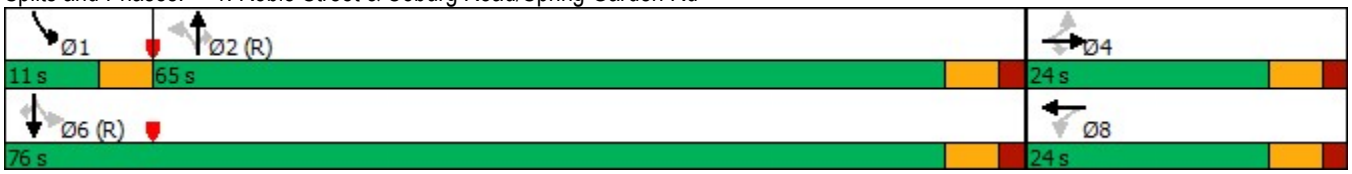
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	66	117	406	184
Volume Left	22	6	17	28
Volume Right	22	83	6	17
cSH	137	278	992	976
Volume to Capacity	0.48	0.42	0.02	0.03
Queue Length 95th (m)	17.8	15.9	0.4	0.7
Control Delay (s)	53.3	27.0	0.5	1.6
Lane LOS	F	D	A	A
Approach Delay (s)	53.3	27.0	0.5	1.6
Approach LOS	F	D		

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	40.8%	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)	45	145	27	60	120	105	45	561	55	185	892	50
Future Volume (vph)	45	145	27	60	120	105	45	561	55	185	892	50
Satd. Flow (prot)	1770	1863	1583	0	3017	0	0	3525	1583	0	3507	1583
Flt Permitted	0.452				0.775			0.778			0.694	
Satd. Flow (perm)	724	1863	1112	0	2252	0	0	2748	1250	0	2431	1345
Satd. Flow (RTOR)			76		103				76			50
Lane Group Flow (vph)	50	161	30	0	317	0	0	673	61	0	1197	56
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Total Split (s)	24.0	24.0	24.0	24.0	24.0		65.0	65.0	65.0	11.0	76.0	76.0
Total Lost Time (s)	6.0	6.0	6.0		6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)	14.3	14.3	14.3		14.3			73.7	73.7		73.7	73.7
Actuated g/C Ratio	0.14	0.14	0.14		0.14			0.74	0.74		0.74	0.74
v/c Ratio	0.49	0.61	0.13		0.78			0.33	0.06		0.67	0.06
Control Delay	54.4	49.5	1.3		40.5			5.5	1.0		9.7	1.7
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay	54.4	49.5	1.3		40.5			5.5	1.0		9.7	1.7
LOS	D	D	A		D			A	A		A	A
Approach Delay		44.5			40.5			5.1			9.4	
Approach LOS		D			D			A			A	
Queue Length 50th (m)	9.5	31.0	0.0		22.2			21.8	0.0		57.7	0.3
Queue Length 95th (m)	21.4	50.4	0.0		36.8			33.7	2.7		90.4	3.8
Internal Link Dist (m)		203.2			123.0			30.6			218.9	
Turn Bay Length (m)	19.0								41.0			41.0
Base Capacity (vph)	130	335	262		489			2025	941		1792	1004
Starvation Cap Reductn	0	0	0		0			0	0		0	0
Spillback Cap Reductn	0	0	0		0			0	0		0	0
Storage Cap Reductn	0	0	0		0			0	0		0	0
Reduced v/c Ratio	0.38	0.48	0.11		0.65			0.33	0.06		0.67	0.06

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 96.8%	ICU Level of Service F
Analysis Period (min) 15	

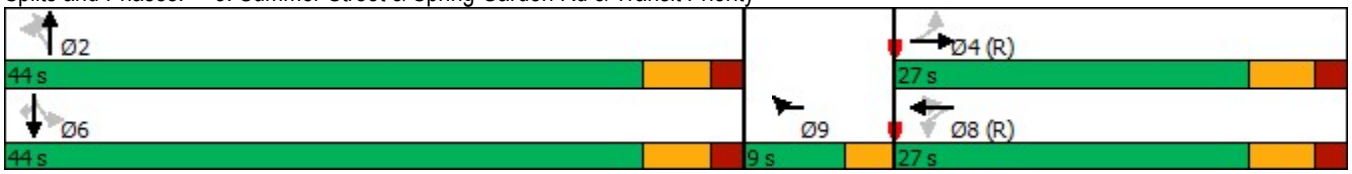
Splits and Phases: 1: Robie Street & Coburg Road/Spring Garden Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	55	210	20	11	95	10	50	35	191	28	115	262
Future Volume (vph)	55	210	20	11	95	10	50	35	191	28	115	262
Satd. Flow (prot)	0	3388	0	0	1853	1368	0	0	1788	0	0	1835
Flt Permitted		0.872			0.956				0.829			0.762
Satd. Flow (perm)	0	2810	0	0	1743	864	0	0	1468	0	0	1378
Satd. Flow (RTOR)		9				56			11			
Lane Group Flow (vph)	0	316	0	0	118	67	0	0	282	0	0	419
Turn Type	Perm	NA		Perm	NA	custom		Perm	NA		Perm	NA
Protected Phases		4			8	9			2			6
Permitted Phases	4			8		8		2			6	
Total Split (s)	27.0	27.0		27.0	27.0	9.0		44.0	44.0		44.0	44.0
Total Lost Time (s)		6.0			6.0	3.0			6.0			6.0
Act Effct Green (s)		31.8			31.8	39.7			28.9			28.9
Actuated g/C Ratio		0.40			0.40	0.50			0.36			0.36
v/c Ratio		0.28			0.17	0.14			0.52			0.84
Control Delay		19.6			20.4	5.8			21.7			38.3
Queue Delay		0.0			0.0	0.0			0.0			0.0
Total Delay		19.6			20.4	5.8			21.7			38.3
LOS		B			C	A			C			D
Approach Delay		19.6			15.1				21.7			33.4
Approach LOS		B			B				C			C
Queue Length 50th (m)		17.7			12.4	0.8			33.1			59.8
Queue Length 95th (m)		33.4			28.8	8.2			46.1			81.0
Internal Link Dist (m)		122.4			102.8				99.4			98.4
Turn Bay Length (m)						35.0						
Base Capacity (vph)		1121			692	497			703			654
Starvation Cap Reductn		0			0	0			0			0
Spillback Cap Reductn		0			0	0			0			0
Storage Cap Reductn		0			0	0			0			0
Reduced v/c Ratio		0.28			0.17	0.13			0.40			0.64

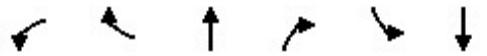
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 56 (70%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Summer Street & Spring Garden Rd & Transit Priority



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1138
Satd. Flow (RTOR)	
Lane Group Flow (vph)	150
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Total Split (s)	44.0
Total Lost Time (s)	6.0
Act Effct Green (s)	28.9
Actuated g/C Ratio	0.36
v/c Ratio	0.36
Control Delay	19.7
Queue Delay	0.0
Total Delay	19.7
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (m)	17.2
Queue Length 95th (m)	26.8
Internal Link Dist (m)	
Turn Bay Length (m)	23.0
Base Capacity (vph)	540
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.28

Intersection Summary



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	61	510	29	79	965
Future Volume (Veh/h)	11	61	510	29	79	965
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	68	567	32	88	1072
Pedestrians	130		10			5
Lane Width (m)	3.6		3.6			3.6
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	11		1			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						129
pX, platoon unblocked	0.88					
vC, conflicting volume	1435	434			729	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1220	434			729	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	87			89	
cM capacity (veh/h)	119	506			776	

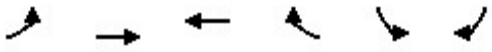
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	378	221	445	715
Volume Left	12	0	0	88	0
Volume Right	68	0	32	0	0
cSH	340	1700	1700	776	1700
Volume to Capacity	0.24	0.22	0.13	0.11	0.42
Queue Length 95th (m)	7.2	0.0	0.0	3.1	0.0
Control Delay (s)	18.8	0.0	0.0	3.2	0.0
Lane LOS	C			A	
Approach Delay (s)	18.8	0.0		1.2	
Approach LOS	C				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	235	15	20	305	20	15	0	15	20	0	20
Future Volume (Veh/h)	15	235	15	20	305	20	15	0	15	20	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	261	17	22	339	22	17	0	17	22	0	22
Pedestrians		155			5			180			95	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		13			0			15			8	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		147			146							
pX, platoon unblocked	1.00			0.97			0.97	0.97	0.97	0.97	0.97	1.00
vC, conflicting volume	456			458			1054	984	454	814	981	600
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	453			421			1033	960	418	785	957	598
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			98			85	100	97	90	100	95
cM capacity (veh/h)	1017			934			115	187	519	215	187	402

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	295	383	34	44
Volume Left	17	22	17	22
Volume Right	17	22	17	22
cSH	1017	934	189	280
Volume to Capacity	0.02	0.02	0.18	0.16
Queue Length 95th (m)	0.4	0.6	5.1	4.4
Control Delay (s)	0.7	0.8	28.2	20.2
Lane LOS	A	A	D	C
Approach Delay (s)	0.7	0.8	28.2	20.2
Approach LOS			D	C

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	96	44	15	20	10
Future Volume (Veh/h)	20	96	44	15	20	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	107	49	17	22	11
Pedestrians		75	135		30	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		6	11		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96				374	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96				374	162
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	99
cM capacity (veh/h)	1460				535	806

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	129	66	33
Volume Left	22	0	22
Volume Right	0	17	11
cSH	1460	1700	602
Volume to Capacity	0.02	0.04	0.05
Queue Length 95th (m)	0.4	0.0	1.4
Control Delay (s)	1.4	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	1.4	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	17	30	20	21	95	10	130	10	30	225	38
Future Volume (Veh/h)	39	17	30	20	21	95	10	130	10	30	225	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	43	19	33	22	23	106	11	144	11	33	250	42
Pedestrians		200			155			55			195	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		17			13			5			16	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											123	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1021	869	526	761	884	500	492			310		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	941	764	363	638	782	500	324			310		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	43	90	93	88	88	75	99			97		
cM capacity (veh/h)	76	199	464	183	194	417	883			1089		

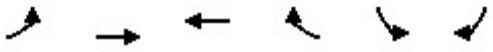
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	95	151	166	325
Volume Left	43	22	11	33
Volume Right	33	106	11	42
cSH	129	306	883	1089
Volume to Capacity	0.73	0.49	0.01	0.03
Queue Length 95th (m)	33.6	20.6	0.3	0.7
Control Delay (s)	86.0	27.7	0.7	1.1
Lane LOS	F	D	A	A
Approach Delay (s)	86.0	27.7	0.7	1.1
Approach LOS	F	D		

Intersection Summary				
Average Delay	17.4			
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	631	5	0	979
Future Volume (Veh/h)	0	5	631	5	0	979
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	701	6	0	1088
Pedestrians	30					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	3					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						55
pX, platoon unblocked	0.87					
vC, conflicting volume	1278	384			737	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1024	384			737	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	197	599			843	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	467	240	544	544
Volume Left	0	0	0	0	0
Volume Right	6	0	6	0	0
cSH	599	1700	1700	1700	1700
Volume to Capacity	0.01	0.27	0.14	0.32	0.32
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0
Control Delay (s)	11.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	95	45	9	31	22
Future Volume (Veh/h)	13	95	45	9	31	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	106	50	10	34	24
Pedestrians					40	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	100				229	95
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				229	95
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				95	97
cM capacity (veh/h)	1443				727	930

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	120	60	58
Volume Left	14	0	34
Volume Right	0	10	24
cSH	1443	1700	799
Volume to Capacity	0.01	0.04	0.07
Queue Length 95th (m)	0.2	0.0	1.9
Control Delay (s)	0.9	0.0	9.9
Lane LOS	A		A
Approach Delay (s)	0.9	0.0	9.9
Approach LOS			A

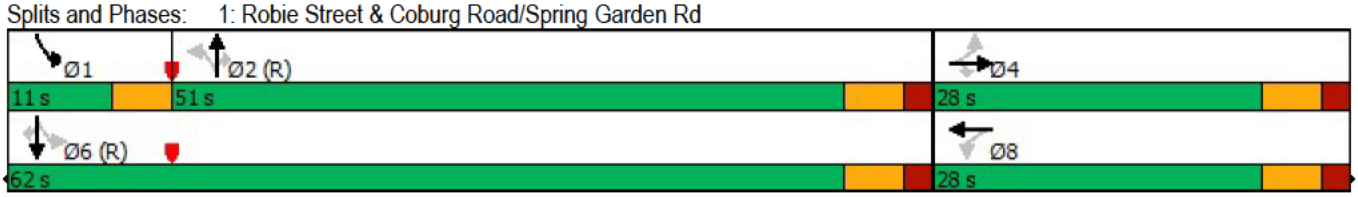
Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	115	32	40	175	155	100	848	55	120	435	50
Future Volume (vph)	75	115	32	40	175	155	100	848	55	120	435	50
Satd. Flow (prot)	1770	1863	1583	0	2854	0	0	3522	1583	0	3500	1583
Flt Permitted	0.377				0.898			0.791			0.586	
Satd. Flow (perm)	588	1863	1169	0	2516	0	0	2784	1009	0	2074	1378
Satd. Flow (RTOR)			85		172				85			36
Lane Group Flow (vph)	83	128	36	0	410	0	0	1053	61	0	616	56
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Total Split (s)	28.0	28.0	28.0	28.0	28.0		51.0	51.0	51.0	11.0	62.0	62.0
Total Lost Time (s)	6.0	6.0	6.0		6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)	15.7	15.7	15.7		15.7			62.3	62.3		62.3	62.3
Actuated g/C Ratio	0.17	0.17	0.17		0.17			0.69	0.69		0.69	0.69
v/c Ratio	0.81	0.39	0.13		0.71			0.55	0.08		0.43	0.06
Control Delay	83.9	34.9	1.0		26.1			9.1	1.1		8.1	3.3
Queue Delay	0.0	0.0	0.0		0.0			0.0	0.0		0.0	0.0
Total Delay	83.9	34.9	1.0		26.1			9.1	1.1		8.1	3.3
LOS	F	C	A		C			A	A		A	A
Approach Delay		46.4			26.1			8.7			7.7	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	14.6	20.7	0.0		21.1			44.0	0.0		22.7	1.0
Queue Length 95th (m)	#33.7	34.6	0.4		34.5			74.6	2.8		41.5	5.7
Internal Link Dist (m)		203.2			123.0			30.6			218.9	
Turn Bay Length (m)	19.0								41.0			41.0
Base Capacity (vph)	143	455	349		744			1926	724		1434	964
Starvation Cap Reductn	0	0	0		0			0	0		0	0
Spillback Cap Reductn	0	0	0		0			0	0		0	0
Storage Cap Reductn	0	0	0		0			0	0		0	0
Reduced v/c Ratio	0.58	0.28	0.10		0.55			0.55	0.08		0.43	0.06

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 91.8% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

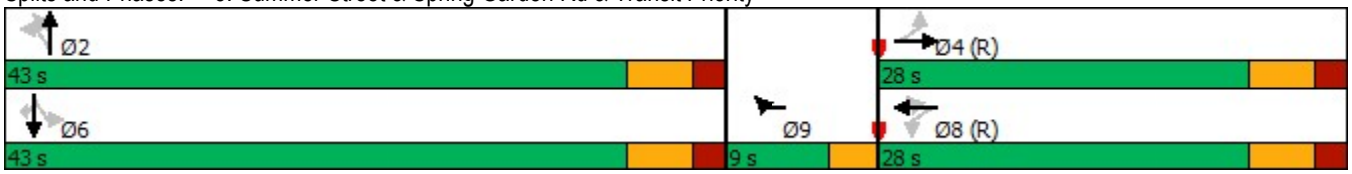
Splits and Phases: 1: Robie Street & Coburg Road/Spring Garden Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	55	190	20	14	170	15	50	65	374	13	60	150
Future Volume (vph)	55	190	20	14	170	15	50	65	374	13	60	150
Satd. Flow (prot)	0	3330	0	0	1855	1294	0	0	1833	0	0	1837
Flt Permitted		0.847			0.963				0.913			0.719
Satd. Flow (perm)	0	2634	0	0	1746	631	0	0	1634	0	0	1316
Satd. Flow (RTOR)		10				56			2			
Lane Group Flow (vph)	0	294	0	0	205	73	0	0	502	0	0	234
Turn Type	Perm	NA		Perm	NA	custom		Perm	NA		Perm	NA
Protected Phases		4			8	9			2			6
Permitted Phases	4			8		8		2			6	
Total Split (s)	28.0	28.0		28.0	28.0	9.0		43.0	43.0		43.0	43.0
Total Lost Time (s)		6.0			6.0	3.0			6.0			6.0
Act Effct Green (s)		30.9			30.9	38.8			29.8			29.8
Actuated g/C Ratio		0.39			0.39	0.48			0.37			0.37
v/c Ratio		0.29			0.30	0.19			0.82			0.48
Control Delay		19.9			21.8	6.6			34.0			21.5
Queue Delay		0.0			0.0	0.0			0.0			0.0
Total Delay		19.9			21.8	6.6			34.0			21.5
LOS		B			C	A			C			C
Approach Delay		19.9			17.8				34.0			20.5
Approach LOS		B			B				C			C
Queue Length 50th (m)		16.9			23.5	1.3			69.8			27.5
Queue Length 95th (m)		30.8			46.5	9.0			94.1			41.3
Internal Link Dist (m)		122.4			102.8				99.4			98.4
Turn Bay Length (m)						35.0						
Base Capacity (vph)		1023			674	387			756			608
Starvation Cap Reductn		0			0	0			0			0
Spillback Cap Reductn		0			0	0			0			0
Storage Cap Reductn		0			0	0			0			0
Reduced v/c Ratio		0.29			0.30	0.19			0.66			0.38

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 56 (70%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 24.6	Intersection LOS: C
Intersection Capacity Utilization 89.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Summer Street & Spring Garden Rd & Transit Priority



Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	120
Future Volume (vph)	120
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1086
Satd. Flow (RTOR)	
Lane Group Flow (vph)	133
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Total Split (s)	43.0
Total Lost Time (s)	6.0
Act Effct Green (s)	29.8
Actuated g/C Ratio	0.37
v/c Ratio	0.33
Control Delay	18.7
Queue Delay	0.0
Total Delay	18.7
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (m)	14.7
Queue Length 95th (m)	24.6
Internal Link Dist (m)	
Turn Bay Length (m)	23.0
Base Capacity (vph)	502
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.26

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	78	900	23	52	425
Future Volume (Veh/h)	11	78	900	23	52	425
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	87	1000	26	58	472
Pedestrians	120		10			15
Lane Width (m)	3.6		3.6			3.6
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	10		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						129
pX, platoon unblocked	0.98					
vC, conflicting volume	1495	648			1146	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1461	648			1146	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	76			89	
cM capacity (veh/h)	93	367			545	

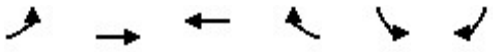
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	99	667	359	215	315
Volume Left	12	0	0	58	0
Volume Right	87	0	26	0	0
cSH	271	1700	1700	545	1700
Volume to Capacity	0.37	0.39	0.21	0.11	0.19
Queue Length 95th (m)	12.9	0.0	0.0	2.8	0.0
Control Delay (s)	25.8	0.0	0.0	4.4	0.0
Lane LOS	D			A	
Approach Delay (s)	25.8	0.0		1.8	
Approach LOS	D				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	360	20	15	250	25	10	5	30	40	0	20
Future Volume (Veh/h)	25	360	20	15	250	25	10	5	30	40	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	400	22	17	278	28	11	6	33	44	0	22
Pedestrians		230			25			310			220	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		19			2			26			18	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		147			146							
pX, platoon unblocked	0.97			0.95			0.97	0.97	0.95	0.97	0.97	0.97
vC, conflicting volume	526			732			1355	1337	746	1074	1334	742
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	495			693			1279	1260	708	988	1257	718
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			97			78	94	89	55	100	92
cM capacity (veh/h)	846			637			51	94	301	99	94	275

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	450	323	50	66
Volume Left	28	17	11	44
Volume Right	22	28	33	22
cSH	846	637	128	125
Volume to Capacity	0.03	0.03	0.39	0.53
Queue Length 95th (m)	0.8	0.7	13.2	19.9
Control Delay (s)	1.0	0.9	50.2	61.8
Lane LOS	A	A	F	F
Approach Delay (s)	1.0	0.9	50.2	61.8
Approach LOS			F	F

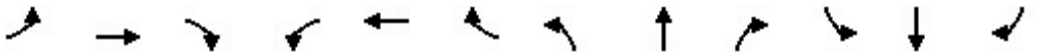
Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	57	82	35	20	15
Future Volume (Veh/h)	15	57	82	35	20	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	63	91	39	22	17
Pedestrians		95	145		35	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		8	12		3	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	165				388	240
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	165				388	240
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	98
cM capacity (veh/h)	1372				519	714

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	80	130	39
Volume Left	17	0	22
Volume Right	0	39	17
cSH	1372	1700	589
Volume to Capacity	0.01	0.08	0.07
Queue Length 95th (m)	0.3	0.0	1.7
Control Delay (s)	1.7	0.0	11.5
Lane LOS	A		B
Approach Delay (s)	1.7	0.0	11.5
Approach LOS			B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	22	28	5	28	75	15	345	5	25	125	39
Future Volume (Veh/h)	37	22	28	5	28	75	15	345	5	25	125	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	41	24	31	6	31	83	17	383	6	28	139	43
Pedestrians		215			110			45			200	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		18			9			4			17	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											123	
pX, platoon unblocked	0.95	0.95	0.95	0.95	0.95		0.95					
vC, conflicting volume	1150	964	420	834	983	696	397			499		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1133	939	369	803	958	696	345			499		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	31	87	94	96	82	75	98			97		
cM capacity (veh/h)	60	179	510	166	175	334	952			967		

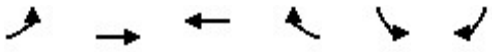
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	96	120	406	210
Volume Left	41	6	17	28
Volume Right	31	83	6	43
cSH	109	260	952	967
Volume to Capacity	0.88	0.46	0.02	0.03
Queue Length 95th (m)	42.0	18.2	0.4	0.7
Control Delay (s)	129.0	30.2	0.6	1.4
Lane LOS	F	D	A	A
Approach Delay (s)	129.0	30.2	0.6	1.4
Approach LOS	F	D		

Intersection Summary				
Average Delay	19.9			
Intersection Capacity Utilization	41.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	953	5	0	512
Future Volume (Veh/h)	0	5	953	5	0	512
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	1059	6	0	569
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						55
pX, platoon unblocked	0.95					
vC, conflicting volume	1346	532			1065	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1258	532			1065	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	155	492			650	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	706	359	284	284
Volume Left	0	0	0	0	0
Volume Right	6	0	6	0	0
cSH	492	1700	1700	1700	1700
Volume to Capacity	0.01	0.42	0.21	0.17	0.17
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	12.4	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.4	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	35	70	27	27	19
Future Volume (Veh/h)	40	35	70	27	27	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	39	78	30	30	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	108				220	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	108				220	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 %	97				96	98
cM capacity (veh/h)	1483				745	964

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	83	108	51
Volume Left	44	0	30
Volume Right	0	30	21
cSH	1483	1700	822
Volume to Capacity	0.03	0.06	0.06
Queue Length 95th (m)	0.7	0.0	1.6
Control Delay (s)	4.1	0.0	9.7
Lane LOS	A		A
Approach Delay (s)	4.1	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		