REGENCY LINKS
TRAFFIC IMPACT STUDY
REVISED FINAL REPORT

PREPARED FOR:
QUAD-RAM CONSTRUCTION LIMITED

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wsp

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1 INTRODUCTION

Background

Plans are being prepared for a multi-use development consisting of about 3,830 residential units and 155,665 square feet of commercial space on vacant land north of the Bayers Lake Business Park in Halifax, Nova Scotia, see Figure 1. Buildout of the development is expected by 2034. The Halifax Regional Municipality (HRM) has requested that a Traffic Impact Study (TIS) be completed to review the impacts to the adjacent transportation network. WSP Canada Inc. has been retained to complete this TIS.

Figure 1 – Development Location

A Traffic Impact Study Usually Considers Four Questions

A TIS usually consists of determining answers to 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 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

The objectives of the traffic impact study are to:

1. Develop projected 2039 background weekday AM and PM peak hourly traffic volumes for Study Intersections. This includes connection of Regency Park Drive and diverted traffic but does not include site development.
2. Estimate the number of weekday AM and PM peak hour vehicle trips that will be generated by the proposed development.
3. Distribute and assign site generated trips to Study Intersections to project 2039 peak hourly volumes that include site generated trips.
4. Evaluate impacts of site generated traffic on the performance of Study Intersections.
5. Complete warrant analyses, as necessary, for Study Intersections and recommend improvements that may be needed at Study Intersections to mitigate the impacts of site development.

2 STUDY AREA DESCRIPTIONS

Description of Existing Development

The proposed development area is on the vacant land bounded by Washmill Lake Drive and Thomas Raddall Drive.

Description of Proposed Development

The proposed development is planned to include 3,830 high-rise residential units and 155,665 square feet of ground floor retail space. The study will consider the build out development scenario with a study horizon year of 2039.

A concept of the proposed development is shown in Figure 2. The proposed development consists of 18 residential towers, of which ten are expected to have commercial space.

Figure 2 - Site Concept

Existing Study Road Descriptions

Washmill Lake Drive is a four-lane major collector through Clayton Park, running from Chain Lake Drive in the west to Dunbrack Street in the east with a speed limit of 60 km/h in this area. There are sidewalks and dedicated bicycle lanes on both sides of Washmill Lake Drive.

Regency Park Drive is a two-lane major collector with a speed limit of 50 km/h that runs south from Lacewood Drive about 850m to its current terminus. There are sidewalks on both sides of the road and no existing dedicated bicycle lanes.

Parkland Drive is a two-lane major collector with a speed limit of 50 km/h. Parkland Drive is a continuation of Regency Park Drive north of Lacewood Drive. There are sidewalks on both sides of the road and no dedicated bicycle lanes.

Lacewood Drive is a four-lane arterial with a posted speed limit of 60 km/h at the study intersections. There are sidewalks on both sides of the road and no dedicated bicycle lanes.

Dunbrack Street is a four-lane arterial with a posted speed limit of 60 km/h. There is a multi-use path on the east side of the street.

Existing Study Intersection Descriptions

The traffic study includes review of three existing intersections along Lacewood Drive, three existing intersections along Dunbrack Street, and two new intersections (#2 and #8). These intersections are shown in Figure 3 and a description of each is provided below.

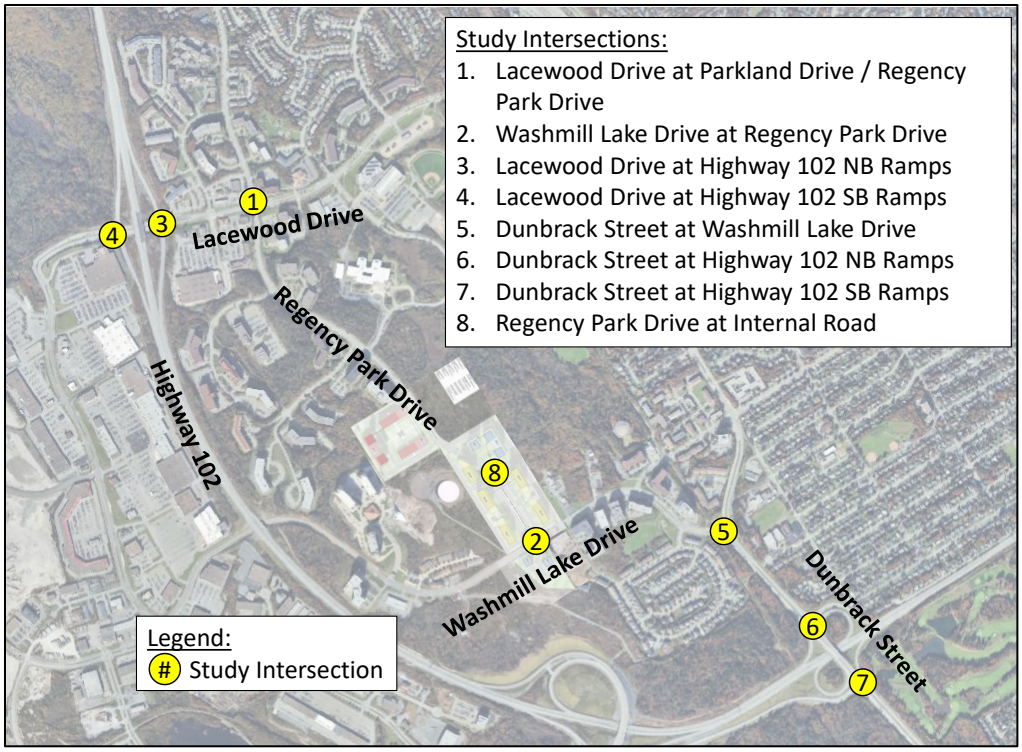


Figure 3 - Study Intersections

Intersection #1 – Lacewood Drive at Parkland Drive/Regency Park Drive is a 4-leg signalized intersection with a left-turn lane, two through lanes, and a right-turn channelized lane in the eastbound and westbound directions (Lacewood Drive approaches); and a left-turn lane, a through lane, and a right-turn channelized lane in the northbound and southbound directions. All approaches have marked pedestrian crossings.

Intersection #2 – Washmill Lake Drive at Regency Park Drive is a proposed 4-leg intersection. Washmill Lake Drive is a four-lane roadway running east-west with a proposed street connection (Regency Park Drive) as the southbound approach and a driveway for the proposed development forming the northbound approach.

Intersection #3&4 – Lacewood Drive at the Highway 102 Ramps are 4-leg signalized multi-lane intersections. The northbound approaches have marked pedestrian crossings.

Intersection #5 – Dunbrack Street at Washmill Lake Drive is a 3-leg signalized intersection with a left-turn lane and two through lanes in the northbound direction, two through lanes and a channelized right-turn lane in the southbound direction, and a shared trough/left-turn lane and a right-turn channelized lane in the eastbound direction. All approaches have marked pedestrian crossings.

Intersection #6&7 – Dunbrack Street at the Highway 102 Ramps are 4-leg unsignalized multi-lane intersections. These intersections are not accessible by pedestrians.

Intersection #8 – Regency Park Drive at Internal Road is a proposed 4-leg intersection. Regency Park Drive is a proposed two-lane roadway running north-south with a proposed street connection (Internal Road) as the eastbound and westbound approaches.

3 BACKGROUND TRAFFIC

Turning Movement Counts

Turning movement counts were collected at the Lacewood Drive at Regency Park Drive / Parkland Drive and Washmill Lake Drive at Bently Drive intersections on Wednesday, June 21, 2023 for the PM peak period and on Thursday, June 22, 2023 for the AM peak period. The counts at the Bently Drive intersection were used to estimate the two-way volumes along Washmill Lake Drive fronting the site and project the future volumes at the Washmill Lake Drive at Regency Park Drive intersection.

Additional turning movement counts were collected at the Lacewood Drive intersections (study intersection 1, 3, and 4) on Tuesday, April 23, 2024 for the PM peak period and on Wednesday, April 24, 2024 for the AM peak period.

Further turning movement counts were collected at the Dunbrack Street intersections (study intersection 5, 6, and 7) on Tuesday, November 19, 2024 for the AM and PM peak periods.

Vehicular counts have been tabulated in 15-minute intervals with peak hours indicated by shaded areas. Pedestrian volumes are summarized in hourly increments. Turning movement counts are summarized in Tables A-1 to A-8, Appendix A. No Seasonal adjustment factor has been applied since the HRM factors for each of the counted days are below 1.0 and would result in a reduction from the observed volumes.

With two turning movement counts available for the Lacewood Drive at Regency Park Drive / Parkland Drive intersection, the higher volume count was applied for the analysis (April 2024 for vehicles and June 2023 for pedestrians).

Traffic Growth Rate

An annual growth rate of 0.5% was applied to project the 2039 Future Background Volumes (see Figure A-2, Appendix A). This is expected to account for continuing development in the area in additional vehicle trips generated by population increases in the area and coincides with the HRM 0.5% annual traffic growth target.

Redistribution of Background Traffic to the Extended Regency Park Drive

With the proposed extension of Regency Park Drive, it is anticipated that some background traffic in the current roadway network will redistribute their trips to the extended roadway. The projected 2039 Future Background Volumes with the Extension of Regency Park Drive are shown in Figure A-3, Appendix A.

Background Development Trips

Trip Generation Study, Bayers Lake Expansion Lands (WSP, April 2022) estimates the generated trips for the new Community Outpatient Centre in the Bayers Lake area. It was estimated that that development will generate:

- 246 two-way trips (165 entering and 81 exiting) during the AM peak hour; and,
- 234 two-way trips (82 entering and 152 exiting) during the PM peak hour.

The Community Outpatient Centre trips were applied to the 2039 future background volumes along Lacewood Drive and Washmill Lake Drive without site generated trips to provide a realistic estimate of traffic during this period.

4 ACTIVE TRANSPORTATION AND TRANSIT

Active Transportation

Sidewalk facilities and / or multi-use paths are available along each of the study roads and sidewalk is planned for both sides along the extended Regency Park Drive. Bicycle facilities are also planned for the extended Regency Park Drive and the developer intends to work with HRM to ensure the desired bicycle facility type is put in place with the road extension. It is understood that HRM recently completed conceptual planning and is now undertaking a functional design project for the unidirectional bicycle lanes along Parkland Drive up to Lacewood Drive and along the existing Regency Park Drive. It is also understood that that project includes a review of transit stop and pedestrian crosswalk locations along the existing Regency Park Drive. Figure 4 shows the existing and candidate bicycle facility routes within the surrounding area.

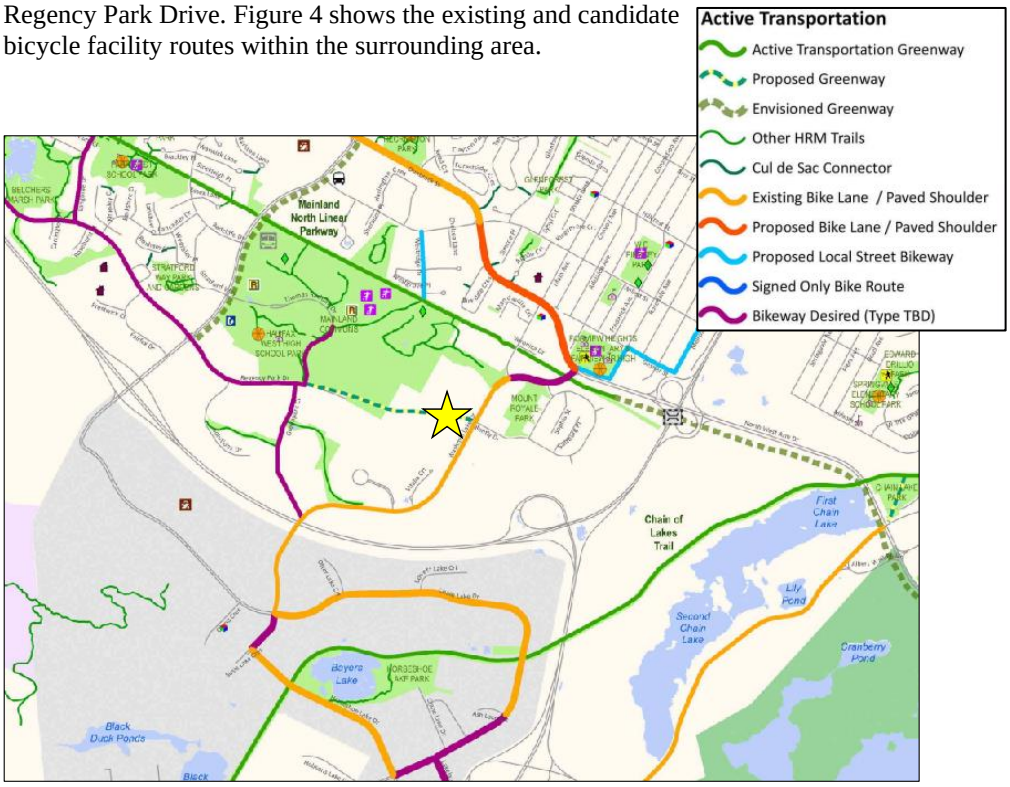


Figure 4 – Candidate Bicycle Facilities
Extracted from Map 2C, Making Connections, Halifax

Transit

There are many transit stops in the area. Transit stops #6719 and #7446 are along Washmill Lake Drive near Bently Drive just to the east of the site, and there are several transit stops and routes along the existing portion of Regency Park Drive and Thomas Raddall Drive. The site is about 1.3km from the Lacewood Terminal, which is serviced by Halifax Transit routes #2, #3, #4, #21, #28, #30, #39, #135, #136, #137, #138, and #433. The existing transit network in the area is shown in Figure 5.

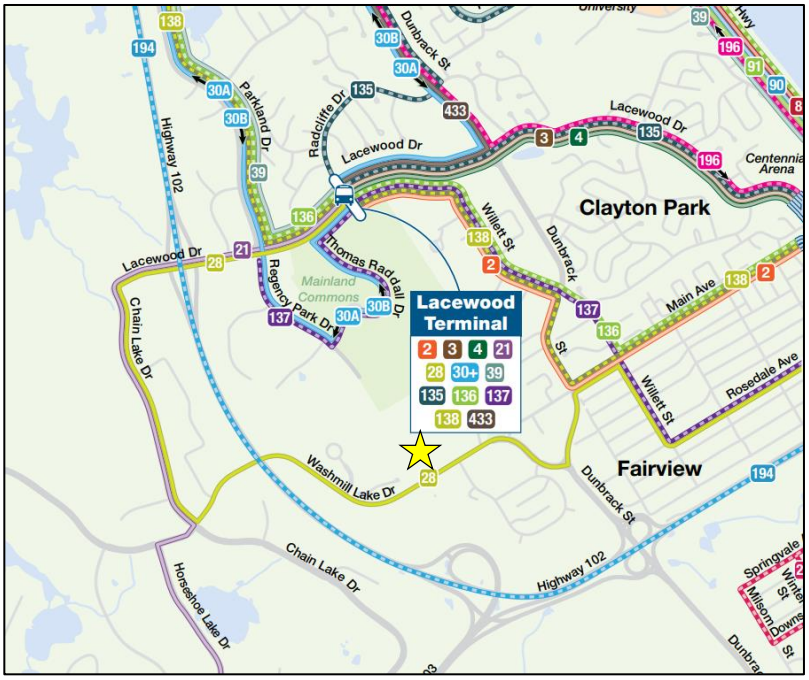


Figure 5 – Existing Halifax Transit Routes

A transit route (#137, Regency Park Express) running along the extended Regency Park Drive fronting the site and connecting to Scotia Square (AM) and Lacewood Terminal (PM) was proposed in Map 1 of the Council Approved Halifax Transit Moving Forward Together Plan (See Figure 6). It is anticipated that the extended street will include routing of transit fronting the site given the current routing along Regency Park Drive and Washmill Lake Drive (See Figure 5) and the proximity to the Lacewood Terminal.

Figure 6 – Proposed Transit Routes in the project area
Extracted from Map 1, Halifax Transit Moving Forward Together Plan

Transit (Continued)

HRM has completed a rapid transit strategy that would see the implementation of four Bus Rapid Transit (BRT) lines and three new ferry routes which will "promote the creation of more compact and walkable communities and increase mobility options alternative to private vehicles". The proposed green line is planned to travel between the Lacwood Terminal and SMU and would provide frequent and reliable transit service between the study area and Peninsular Halifax.

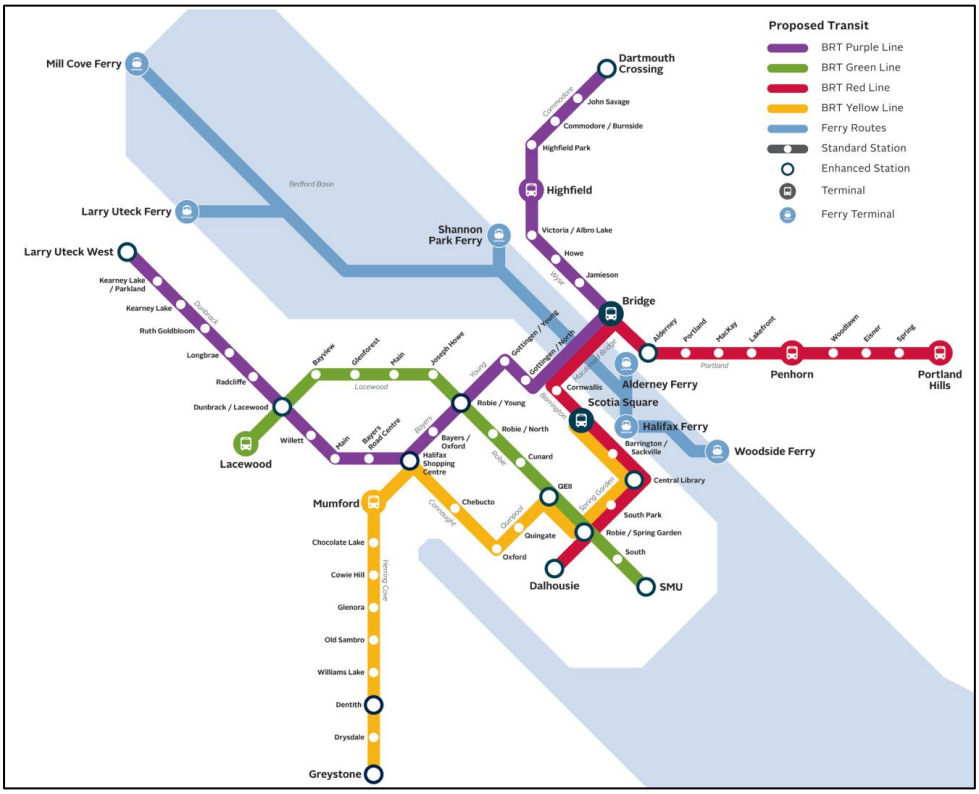


Figure 7 – HRM Rapid Transit Strategy – Proposed Routes

5 TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

Prepared Trip Generation Estimates

When using the published trip generation rates in the Trip Generation Manual, the transportation engineer's objective should be to provide a realistic estimate of the number of trips that will be generated by the proposed development.

Proposed Development

The proposed development is expected to include 3,830 high-rise residential units and 155,665 square feet of ground floor retail space.

Anticipated Land Use for the Proposed Development

Trip generation estimates for the proposed development were prepared using published rates and equations from *Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers, Washington, 2021). Trip generation estimates for the AM and PM peak hours of adjacent streets have been prepared based on the number of units for residential developments and 1,000 square feet of leasable area for the retail space.

Based on the proposed development's proximity to numerous amenities and that the site lies within an area of HRM with high active transportation and transit 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 (See Table 1).

With residential and retail land uses planned for this development, many of the trips generated by the site 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 B.

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.

Trips Generated by the Proposed Development – Total Trips Generated

Trip generation estimates for the proposed development are summarized in Table 1. It is estimated that the development will generate:

- 1,415 two-way external person trips (516 entering and 899 exiting) during the AM peak hour; and,
- 2,116 two-way external person trips (1,204 entering and 912 exiting) during the PM peak hour.

Table 1 – Trip Generation Estimates for the Proposed Development

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
Multifamily Housing (High Rise) 222 MU1, MU2, MU3, MU5, MU6, MU9	1372	Equations from Page 307 & 308				83	237	236	144
Multifamily Housing (High Rise) 222 MU4, MU7, MU8, MU10	946					59	168	167	102
Multifamily Housing (High Rise) 222 MU11, MU12	420					29	82	82	50
Multifamily Housing (High Rise) 222 MU13, MU14, MU15, MU16, MU17, MU18	1092					67	192	190	117
Strip Retail Plaza (<40k GLA) 822 MU1, MU2, MU3, MU5, MU6, MU9	88.1 KGLA	Rates from Pages 230 & 231				125	83	290	290
Strip Retail Plaza (<40k GLA) 822 MU4, MU7, MU8, MU10	67.6 KGLA					96	64	223	223
Baseline Vehicle Trip Estimate for the Proposed Development						459	826	1188	926
Total Person Trips [4]						528	911	1397	1105
Internal Person Trips [5]						12	12	193	193
External Person Trips [5]						516	899	1204	912

NOTES:
1. Rates and equations are from *Trip Generation, 11th Edition* , Institute of Transportation Engineers, 2021. Directional splits were corrected using the Errata released by ITE.
2. KGLA is 'Gross Leasable Area x 1000 SF'.
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 dara 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).
5. Internal and external person trip estimates are based on methodology from National Cooperative Highway Research Program (NCHRP) 684 with associated worksheets provided in Appendix B.

Estimated Modal Shares of Development Trips

The site is located near the Lacewood Transit Terminal and several transit routes and there are existing or planned bicycle facilities along Washmill Lake Drive, Regency Park Drive, and Parkland Drive with existing or planned active transportation connections to the Mainland North Trail, the Bayers Lake Business Park, and the Chain of Lakes Trail (See Section 4). HRM's Integrated Mobility Plan (IMP) sets a modal share target that by 2031 at least 26% of all person trips in the Inner Suburban Area will be made by transit or active transportation. The horizon year for this TIS is 2039 and this site is located within a five-minute bike ride of a major transit terminal (Lacewood) as well as near several existing and planned active transportation facilities. While it is expected that the non-auto modal share of site trips will exceed the HRM targets for this area, a conservative 25% modal share of transit and active transportation has been applied to site generated person trips. The non-auto modal share for this area in 2016 was about 25%.

It is estimated that the development will generate:

- 919 two-way vehicle trips (335 entering and 584 exiting) during the AM peak hour; and,
- 1,376 two-way vehicle trips (783 entering and 593 exiting) during the PM peak hour.

Table 2 –Total Trip Generation Estimates for the Proposed Development

Travel Mode	Modal Share	AM Peak		PM Peak	
		In	Out	In	Out
External Person Trips		**516**	**899**	**1204**	**912**
Auto Driver	**65%**	335	584	783	593
Auto Passenger	**10%**	52	90	120	91
Transit	**20%**	103	180	241	182
Active Modes	**5%**	26	45	60	46

Rationalization of Estimated Modal Share

The projected transit modal share for the proposed development considers the proximity of the Lacewood terminal, the existing transit routes along Washmill Lake Drive fronting the site, and the planned transit route along the extended Regency Park Drive.

The projected active transportation modal share for the proposed development considers the existing bicycle lanes and sidewalk along Washmill Lake Drive, the sidewalk and bicycle facilities planned for the extended Regency Park Drive, and the proximity of the site to the Bayers Lake business park, and several nearby facilities such as Halifax West High School, Canada Games Center, and the Lacewood Square retail development.

Trip Distribution and Assignment

The proposed development generated trips were distributed to the Study Intersections based on counted volumes and review of travel origin and destinations around the site. For retail development attraction, regional residential development has been considered. For new residential development, employment densities and retail draws have been considered. The estimated directional distributions are provided below.

Direction	Residential	Commercial
North on Parkland Drive	5%	5%
South/West on Washmill Lake Drive	25%	30%
North/East to Lacewood Drive	15%	15%
East on Washmill Lake Drive	30%	25%
North/West to Lacewood Drive	25%	25%

Volume Figures

Weekday AM and PM peak hourly estimated site generated vehicle volumes (See Table 2) were distributed and assigned to external streets and intersections in the study area using the above assumptions. Assigned AM and PM peak hourly site generated volumes are illustrated diagrammatically in Figure A-4, Appendix A. Assigned site development trips were added to background volumes with redistribution for the extended Regency Park Drive (Figure A-3) to provide estimates of the AM and PM peak hour volumes at study area intersections for development build-out which are illustrated diagrammatically on Figure A-5, Appendix A.

6 INTERSECTION OPERATIONAL ANALYSIS

Intersection Operational Analysis was completed to estimate how intersections may be expected to operate into the future without and with site generated trips. This section of the report addresses how left-turn lane warrants and traffic signal warrants were conducted and how each intersection was evaluated. The following subsections identify each study intersection and summarize the results of the operational analysis.

Left-Turn Lane Warrant Analysis

Left-turn movements on a street may cause both operational and safety problems. Operational problems result as a vehicle stopped waiting for an opportunity to turn across 'heavy' opposing traffic causes a queue of stopped vehicles to form. Safety problems result from rear end collisions when a stopped left-turning vehicle is struck by an advancing vehicle, or from head-on or right-angle collisions when a left-turning vehicle is struck by an opposing vehicle.

The *Geometric Design Standards for Ontario Highways Manual* contains a nomograph for left-turn lane analysis for four-lane undivided streets at unsignalized intersections. The analysis method, which is normally used by WSP Atlantic to evaluate the warrant for left-turn lanes along four lane roadways, uses a nomograph that considers left-turning volume and opposing volume. A point, based on left turning and 'opposing' volumes, plotted to the right of the 'warrant line' indicates that a left-turn lane is warranted for the conditions used in the analysis. Similarly, a point that is plotted to the left of the warrant line indicates that a left-turn lane is not warranted.

Evaluation of left turn lane warrants were completed for the Washmill Lake Drive at Regency Park Drive intersection using 2039 traffic volumes with redistribution of existing traffic onto the extended Regency Park Drive without and with the proposed development and for the Regency Park Drive at internal Road intersection. The results indicate:

- **An eastbound left-turn lane is warranted** on Washmill Lake Drive for traffic turning to Regency Park Drive without and with the addition of site generated trips.
- **A westbound left turn lane is warranted** on Washmill Lake Drive for traffic turning to the development connection south of Washmill Lake Drive (to buildings MU11 and MU12 on Figure 2).
- **Northbound and southbound left-turn lanes are warranted** along Regency Park Drive at the Internal Road intersection (Study Intersection #8).

The addition of a warranted left-turn lane has been identified based on safety of left turning vehicles but are at the discretion of HRM based on operational needs and right-of-way limitations. Left-turn lane warrant results are available in Figure B-1 and Figure B-2, Appendix B.

Traffic Signal Warrant Analysis

A signal warrant analysis is completed to determine if the installation of traffic signals at an intersection will provide a positive impact on total intersection operation. That is, the benefits in time saved and improved safety that will accrue to vehicles entering from a side street will exceed the impact that signals will have in time lost and potential additional collisions for vehicles approaching the intersection on the main street.

The *Canadian Traffic Signal Warrant Matrix Analysis (Transportation Association of Canada (TAC), 2005)* considers 100 warrant points as an indication that traffic signals will provide a positive impact. Signal warrant analysis uses vehicular and pedestrian volumes, and intersection, roadway and study area characteristics to calculate a warrant point value.

Evaluation of traffic signal warrants were completed for the Washmill Lake Drive at Regency Park Drive intersection using 2039 traffic volumes with the proposed development and **traffic signals are warranted** (277 vehicle warrant points) with the addition of site generated trips. Evaluation of traffic signal warrants were completed for the Regency Park Drive at Internal Road intersection using 2039 traffic volumes with the proposed development and **traffic signals are not warranted** (79 vehicle warrant points). Signal warrant results are available in Tables B-1, B-2, and B-3, Appendix B.

Evaluation of traffic signal warrants were completed for the Dunbrack Street at Highway 102 Ramp intersections using 2039 traffic volumes without and with the proposed development and **traffic signals are warranted** without and with the addition of site generated trips. Signal warrant results are available in Tables B-4, B-5, B-6, and B-7, Appendix B.

- Dunbrack Street @ 102 NB Ramps – Future Background **(142 warrant points)**
- Dunbrack Street @ 102 NB Ramps – Site Trips **(186 warrant points)**
- Dunbrack Street @ 102 SB Ramps – Future Background **(316 warrant points)**
- Dunbrack Street @ 102 SB Ramps – Site Trips **(350 warrant points)**

Intersection Capacity Analysis Results

Synchro 12 software has been used for performance evaluation of the Study Intersections. Summaries of the results are provided in the following sub-sections and detailed results of the analyses are included in Appendix C.

While Synchro is used to determine macro level delays and LOS at intersections, SimTraffic is a microscopic model that simulates real world conditions. Each vehicle in a traffic system is individually tracked through a SimTraffic model and comprehensive measures of effectiveness are collected on every vehicle during each 0.1 second of the simulation. SimTraffic analysis has been completed for ten 1-hour runs for the PM peak hour in scenario 2 and reported for select intersections.

It should be noted that all signalized intersections were analyzed using optimized signal timings.

6.1 ANALYSIS SCENARIOS

Summary Analysis Scenarios Considered

Scenario 1A - Future 2039 without Site: Represents future 2039 traffic volumes on the existing road network, including the existing traffic control and lane configurations of the Study Intersections.

Scenario 1B - Future 2039 without Site – Diverted Trips: Represents future 2039 traffic volumes with future diverted trips onto the Regency Park Drive connection. The study intersections have been modified to accommodate an eastbound left-turn lane on Washmill Lake Drive at Regency Park Drive based on the warrants summarized in Appendix B.

***Scenario 2 - Future 2039 with Site*:** Represents future 2039 traffic volumes on the existing road network, including the existing traffic control and lane configurations of the Study Intersections with buildout of the proposed development. The study intersections have been modified to accommodate left-turn lanes and traffic signalization at the Washmill Lake Drive at Regency Park Drive intersection based on the warrants summarized in Appendix B.

6.2 INT #1: LACEWOOD DRIVE AT REGENCY PARK DRIVE

Operational performance results for this intersection are provided in Table 3 for both the AM and PM peak hours for each of the analysis scenarios.

The intersection is expected to operate within HRM acceptable limits laid out in HRM's current TIS Guidelines during the AM and PM peak hours without and with site generated trips. The maximum v/c ratio is projected to be 0.76 for the eastbound right-turn movement. Some changes in the operational performance of this intersection are expected with the addition of the proposed development.

Table 3 - Intersection Capacity Analysis: Lacewood Drive at Regency Park Drive

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement												Overall Intersection	
	Lacewood Drive						Regency Park Drive			Parkland Drive				
	EB-L	EB-TT	EB-R	WB-L	WB-TT	WB-R	NB-L	NB-T	NB-R	SB-L	SB-T	SB-R	Delay	Control
Scenario 1A - 2039 Future without Site AM Peak Hour - without diversions (Page C-1)														
Delay	8.0	18.5	10.1	7.9	16.5	7.4	19.9	15.7	5.2	23.4	16.0	5.1	14.3	
v/c	0.18	0.50	0.29	0.18	0.33	0.22	0.38	0.11	0.29	0.54	0.14	0.32		
Queue	13.4	42.8	18.6	12.9	28.7	12.2	25.4	11.9	11.0	36.3	14.6	11.7		
Scenario 1B - 2039 Future without Site AM Peak Hour (Page C-17)														
Delay	7.7	18.2	8.8	8.1	14.8	6.6	19.3	16.2	5.1	23.2	16.9	5.2	13.7	
v/c	0.15	0.46	0.23	0.23	0.25	0.18	0.34	0.16	0.35	0.53	0.23	0.27		
Queue	11.3	38.5	15.0	16.0	26.0	11.3	22.2	16.0	12.3	34.7	21.3	10.5		
Scenario 2 - 2039 Future with Site AM Peak Hour (Page C-31)														
Delay	10.5	22.8	16.4	12.2	19.0	7.5	28.6	15.8	4.3	20.7	16.2	5.1	16.7	
v/c	0.16	0.53	0.48	0.37	0.32	0.19	0.69	0.19	0.42	0.46	0.23	0.24		
Queue	14.6	48.0	34.9	28.8	35.0	12.5	54.8	21.5	14.3	35.7	24.7	11.1		
Scenario 1A - 2039 Future without Site PM Peak Hour - without diversions (Page C-9)														
Delay	12.9	20.5	11.2	9.2	22.0	11.9	30.0	21.0	6.4	27.3	20.6	6.1	17.8	
v/c	0.63	0.60	0.33	0.37	0.61	0.35	0.59	0.23	0.23	0.50	0.20	0.37		
Queue	39.5	61.1	24.2	21.8	57.0	23.2	42.1	23.9	10.7	36.0	20.8	14.3		
Scenario 1B - 2039 Future without Site PM Peak Hour (Page C-24)														
Delay	10.0	21.5	10.7	9.2	19.6	10.8	28.9	23.4	11.5	28.9	21.9	8.4	17.6	
v/c	0.48	0.60	0.31	0.44	0.53	0.32	0.54	0.42	0.38	0.53	0.31	0.34		
Queue	30.8	57.7	20.5	27.6	50.6	21.4	37.1	39.2	21.7	35.8	30.3	16.0		
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-40)														
Delay	15.6	30.2	30.2	23.6	24.7	12.6	45.7	23.1	13.0	25.8	22.3	10.1	25.1	
v/c	0.55	0.68	0.76	0.75	0.53	0.31	0.83	0.36	0.45	0.41	0.29	0.27		
Queue	39.1	71.0	73.3	74.4	60.8	24.3	93.9	46.8	36.4	36.8	39.4	20.2		

6.3 INT #2: WASHMILL LAKE DRIVE AT REGENCY PARK DRIVE

Operational performance results for this intersection are provided in Table 4 for both the AM and PM peak hours for each of the analysis scenarios. Left-turn lanes and signals are included as warranted.

With added left turn lanes as warranted and with signalization in Scenario 2, the intersection is expected to operate within HRM acceptable limits during the AM and PM peak hours without and with site generated trips. The maximum v/c ratio is projected to be 0.84 in the westbound direction during the PM peak hour.

Table 4 - Intersection Capacity Analysis: Washmill Lake Drive at Regency Park Drive

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement							Overall Intersection	
	Washmill Lake Drive				Access	Regency Park Drive			
	EB-L	EB-TT	WB-TTR			SB-LR		Delay	Control
Scenario 1B - 2039 Future without Site AM Peak Hour (Page C-23)									
Delay	9.0	0.0	0.0		-	14.8		1.9	
v/c	0.09	0.12	0.22		-	0.21			
Queue	1.6	0.0	0.0		-	6.3			
	EB-L	EB-TT	WB-L	WB-TTR	NB-LTR	SB-L	SB-TR	Delay	Control
Scenario 2 - 2039 Future with Site AM Peak Hour (Page C-32)									
Delay	52.5	17.2	14.4	20.2	13.8	27.8	7.0	21.6	
v/c	0.80	0.36	0.05	0.61	0.17	0.57	0.22		
Queue	45.6	35.9	4.9	62.4	19.2	63.5	15.0		
	EB-L	EB-TT	WB-TTR			SB-LR		Delay	Control
Scenario 1B - 2039 Future without Site PM Peak Hour (Page C-30)									
Delay	10.4	0.0	0.0		-	27.1		2.6	
v/c	0.19	0.28	0.30		-	0.46			
Queue	5.4	0.0	0.0		-	18.2			
	EB-L	EB-TT	WB-L	WB-TTR	NB-LTR	SB-L	SB-TR	Delay	Control
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-41)									
Delay	35.3	17.2	24.2	34.7	21.5	51.4	11.3	28.2	
v/c	0.75	0.56	0.19	0.84	0.12	0.76	0.36		
Queue	72.6	88.8	13.0	128.9	16.1	97.8	26.1		

6.4 INT #3: LACEWOOD DRIVE AT HIGHWAY 102 NB RAMPS

Operational performance results for this intersection are provided in Table 5 for both the AM and PM peak hours for each of the analysis scenarios.

The intersection is expected to operate within NSPW guidelines during the AM and PM peak hours without and with site generated trips, with the exception of the northbound right movement during PM peak hour with the addition of site generated trips. The maximum v/c ratio is projected to be 0.98 for the northbound right-turn movement. Some changes in the operational performance of this intersection are expected with the addition of the proposed development.

SimTraffic analysis (ten one-hour runs) was completed to supplement the assessment of this intersection due to the high delay and queuing on the northbound right turn movement. This additional analysis indicates that during the PM peak hour of Scenario 2, the northbound right turning movement may operate with an average delay of about 35 seconds with a 95th percentile queue of 81.8m (See Page C-51, Appendix C).

Table 5 - Intersection Capacity Analysis: Lacewood Drive at Highway 102 NB Ramps

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement							Overall Intersection	
	Lacewood Drive				Highway 102 NB Ramps				
	EB-LL	EB-TT	WB-TTT	WB-R	NB-L	NB-LT	NB-R	Delay	Control
Scenario 1A - 2039 Future without Site AM Peak Hour - without diversions (Page C-2)									
Delay	2.2	1.8	40.7	7.9	28.7	28.7	33.9	21.1	
v/c	0.14	0.26	0.66	0.51	0.17	0.17	0.84		
Queue	8.0	25.7	53.4	19.7	19.7	19.7	72.2		
Scenario 1B - 2039 Future without Site AM Peak Hour (Page C-18)									
Delay	0.3	0.3	41.9	8.9	31.8	31.8	30.4	20.5	
v/c	0.12	0.21	0.63	0.53	0.21	0.21	0.85		
Queue	0.5	0.0	47.7	20.5	20.7	20.7	62.4		
Scenario 2 - 2039 Future with Site AM Peak Hour (Page C-34)									
Delay	2.1	1.0	38.9	7.6	24.8	24.8	34.0	20.6	
v/c	0.17	0.27	0.66	0.60	0.14	0.14	0.86		
Queue	25.8	12.7	58.4	22.6	18.2	18.2	84.9		
Scenario 1A - 2039 Future without Site PM Peak Hour - without diversions (Page C-10)									
Delay	22.0	3.4	45.5	10.7	36.6	36.5	52.5	27.0	
v/c	0.78	0.47	0.78	0.52	0.37	0.37	0.88		
Queue	96.2	8.2	114.7	38.3	52.5	52.4	116.9		
Scenario 1B - 2039 Future without Site PM Peak Hour (Page C-25)									
Delay	12.9	4.1	48.8	8.5	37.9	37.8	49.2	25.7	
v/c	0.68	0.41	0.80	0.54	0.39	0.39	0.87		
Queue	139.6	3.2	99.4	28.3	52.5	52.4	109.1		
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-43)									
Delay	30.7	9.6	50.7	11.0	31.2	31.1	**66.1**	33.3	
v/c	0.89	0.52	0.84	0.65	0.30	0.29	**0.98**		
Queue	139.7	0.0	108.3	43.4	52.5	52.4	**205.9**		

6.5 INT #4: LACEWOOD DRIVE AT HIGHWAY 102 SB RAMPS

Operational performance results for this intersection are provided in Table 6 for both the AM and PM peak hours for each of the analysis scenarios.

The intersection is expected to operate within NSPW guidelines during the AM and PM peak hours without and with site generated trips. The maximum v/c ratio is projected to be 0.77 for the eastbound through movement. Negligible changes in the operational performance of this intersection are expected with the addition of the proposed development.

Table 6 - Intersection Capacity Analysis: Lacewood Drive at Highway 102 SB Ramps

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement							Overall Intersection	
	Lacewood Drive				Highway 102 SB Ramps				
	EB-TTTT	EB-R	WB-L	WB-TT	SB-L	SB-LT	SB-R	Delay	Control
Scenario 1A - 2039 Future without Site AM Peak Hour - without diversions (Page C-3)									
Delay	43.6	6.0	1.6	1.1	50.6	50.6	0.6	17.9	
v/c	0.58	0.25	0.24	0.20	0.64	0.64	0.35		
Queue	34.8	7.3	3.9	7.1	52.4	52.4	0.0		
Scenario 1B - 2039 Future without Site AM Peak Hour (Page C-19)									
Delay	44.0	11.9	2.1	0.3	50.6	50.6	0.6	17.5	
v/c	0.52	0.29	0.24	0.17	0.64	0.64	0.35		
Queue	29.1	11.6	17.4	0.0	52.4	52.4	0.0		
Scenario 2 - 2039 Future with Site AM Peak Hour (Page C-35)									
Delay	43.8	11.3	1.9	0.4	50.2	50.4	0.6	17.4	
v/c	0.57	0.28	0.28	0.22	0.65	0.66	0.35		
Queue	33.2	11.5	0.0	0.9	54.9	55.2	0.0		
Scenario 1A - 2039 Future without Site PM Peak Hour - without diversions (Page C-11)									
Delay	38.6	7.4	16.2	5.0	63.8	63.8	0.6	22.8	
v/c	0.77	0.47	0.54	0.39	0.68	0.68	0.36		
Queue	119.0	29.6	106.5	17.0	60.1	60.1	0.0		
Scenario 1B - 2039 Future without Site PM Peak Hour (Page C-26)									
Delay	39.6	5.8	6.8	2.1	64.1	64.1	0.6	21.3	
v/c	0.74	0.48	0.51	0.34	0.68	0.68	0.36		
Queue	103.8	21.4	132.3	96.1	60.3	60.3	0.0		
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-44)									
Delay	40.1	6.6	9.6	2.7	66.0	66.3	0.6	22.6	
v/c	0.76	0.48	0.58	0.36	0.73	0.74	0.36		
Queue	111.8	24.9	134.9	100.3	69.5	69.8	0.0		

6.6 INT #5: DUNBRACK STREET AT WASHMILL LAKE DRIVE

Operational performance results for this intersection are provided in Table 7 for both the AM and PM peak hours for each of the analysis scenarios.

The intersection is expected to operate within HRM acceptable limits laid out in HRM's current TIS Guidelines during the AM and PM peak hours without and with site generated trips. The maximum v/c ratio is projected to be 0.88 for the eastbound right-turn movement. Some changes in the operational performance of this intersection are expected with the addition of the proposed development. The northbound left turn lane at the intersection currently has about 120m of storage. Consideration should be given to lengthening this left turn lane or providing dual northbound left turn lanes at this intersection to accommodate background traffic and site generated trips.

Table 7 - Intersection Capacity Analysis: Dunbrack Street at Washmill Lake Drive

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement						Overall Intersection	
	Washmill Lake Drive		Dunbrack Street					
	EB-L	EB-R	NB-L	NB-TT	SB-TT	SB-R	Delay	Control
Scenario 1A - 2039 Future without Site AM Peak Hour - without diversions (Page C-4)								
Delay	25.1	8.7	10.9	8.1	30.8	21.0	15.5	
v/c	0.12	0.63	0.55	0.38	0.71	0.14		
Queue	13.5	21.8	54.5	53.5	82.6	16.4		
Scenario 1B - 2039 Future without Site AM Peak Hour (Page C-20)								
Delay	24.6	8.7	11.1	8.2	29.1	19.3	15.0	
v/c	0.12	0.65	0.56	0.38	0.69	0.13		
Queue	13.1	22.0	54.4	53.8	76.9	15.0		
Scenario 2 - 2039 Future with Site AM Peak Hour (Page C-36)								
Delay	30.2	9.0	16.1	8.5	31.7	17.9	17.0	
v/c	0.43	0.71	0.67	0.38	0.72	0.32		
Queue	40.3	26.4	81.5	53.8	76.9	27.5		
Scenario 1A - 2039 Future without Site PM Peak Hour - without diversions (Page C-12)								
Delay	42.9	14.2	21.5	4.9	34.9	23.5	20.0	
v/c	0.32	0.81	0.70	0.33	0.78	0.17		
Queue	28.9	35.2	121.7	51.0	157.2	28.4		
Scenario 1B - 2039 Future without Site PM Peak Hour (Page C-27)								
Delay	42.7	14.2	21.7	5.0	35.2	23.6	20.1	
v/c	0.32	0.82	0.70	0.33	0.79	0.17		
Queue	28.9	36.0	123.5	52.5	159.1	28.6		
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-45)								
Delay	54.9	19.7	37.9	6.7	50.8	30.3	33.0	
v/c	0.66	0.88	0.86	0.34	0.89	0.49		
Queue	70.6	74.5	214.0	53.8	161.0	66.1		

6.7 INT #6: DUNBRACK STREET AT HIGHWAY 102 NB RAMPS

Operational performance results for this intersection are provided in Table 8 for both the AM and PM peak hours for each of the analysis scenarios. Signals are warranted for to accommodate background traffic and the intersection is expected to operate poorly as a STOP controlled intersection, as shown below.

The signalized intersection is expected to operate within NSPW guidelines during the AM and PM peak hours without and with site generated trips. The maximum v/c ratio is projected to be 0.64 for the southbound through movement in the PM peak hour. Negligible changes in the operational performance of this intersection are expected with the addition of the proposed development.

Table 8 - Intersection Capacity Analysis: Dunbrack Street at Highway 102 NB Ramps

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement						Overall Intersection	
	Highway 102 NB Ramps		Dunbrack Street					
	WB-LT	WB-R	NB-TT	NB-R	SB-TT	SB-R	Delay	Control
Scenario 1A - 2039 Future without Site AM Peak Hour - without diversions (Page C-7)								
Delay	**134.8**	0.0	0.0	0.0	0.0	0.0	15.4	
v/c	**1.13**	-	0.30	0.26	0.20	0.17		
Queue	106.2	-	0.0	0.0	0.0	0.0		
Scenario 1B - 2039 Future without Site AM Peak Hour (Page C-21)								
Delay	21.2	0.2	6.7	1.8	5.8	2.5	5.4	
v/c	0.36	0.12	0.43	0.36	0.30	0.27		
Queue	22.4	0.0	42.6	9.6	26.9	12.0		
Scenario 2 - 2039 Future with Site AM Peak Hour (Page C-37)								
Delay	22.1	0.2	6.7	1.7	5.8	0.3	5.1	
v/c	0.36	0.14	0.45	0.36	0.32	0.22		
Queue	23.0	0.0	45.9	9.6	30.2	0.0		
Scenario 1A - 2039 Future without Site PM Peak Hour - without diversions (Page C-15)								
Delay	**Err**	0.0	0.0	0.0	0.0	0.0	Err	
v/c	**3.81**	-	0.28	0.27	0.32	0.23		
Queue	**Err**	-	0.0	0.0	0.0	0.0		
Scenario 1B - 2039 Future without Site PM Peak Hour (Page C-28)								
Delay	22.5	0.5	10.9	2.6	12.0	7.7	9.3	
v/c	0.56	0.29	0.54	0.45	0.62	0.47		
Queue	51.3	0.0	57.4	12.6	69.7	38.8		
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-46)								
Delay	24.1	0.6	11.2	2.5	12.3	8.4	9.6	
v/c	0.57	0.33	0.57	0.44	0.64	0.52		
Queue	55.4	0.0	67.0	12.6	79.4	47.5		

6.8 INT #7: DUNBRACK STREET AT HIGHWAY 102 SB RAMPS

Operational performance results for this intersection are provided in Table 9 for both the AM and PM peak hours for each of the analysis scenarios. Signals are warranted to accommodate background traffic and the intersection is expected to operate poorly as a STOP controlled intersection, as shown below.

The signalized intersection is expected to operate within NSPW guidelines during the AM and PM peak hours without and with site generated trips. The maximum v/c ratio is projected to be 0.75 for the eastbound left-turn/through movement in the AM peak period. Negligible changes in the operational performance of this intersection are expected with the addition of the proposed development.

Table 9 - Intersection Capacity Analysis: Dunbrack Street at Highway 102 SB Ramps

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement						Overall Intersection	
	Highway 102 SB Ramps		Dunbrack Street					
	EB-LT	EB-R	NB-TT	NB-R	SB-TT	SB-R	Delay	Control
Scenario 1A - 2039 Future without Site AM Peak Hour - without diversions (Page C-8)								
Delay	**544.3**	**75.7**	0.0	0.0	0.0	0.0	92.0	
v/c	**2.09**	**1.07**	0.31	0.33	0.12	0.02		
Queue	**271.7**	**178.0**	0.0	0.0	0.0	0.0		
Scenario 1B - 2039 Future without Site AM Peak Hour (Page C-22)								
Delay	26.9	1.4	16.3	6.2	11.9	0.0	11.4	
v/c	0.72	0.55	0.65	0.59	0.25	0.03		
Queue	102.0	0.0	94.1	39.5	31.7	0.0		
Scenario 2 - 2039 Future with Site AM Peak Hour (Page C-38)								
Delay	28.7	1.4	17.4	6.6	12.6	0.1	12.1	
v/c	0.75	0.55	0.66	0.59	0.26	0.06		
Queue	113.3	0.0	100.9	42.6	35.2	0.0		
Scenario 1A - 2039 Future without Site PM Peak Hour - without diversions (Page C-16)								
Delay	**Err**	**342.5**	0.0	0.0	0.0	0.0	893.1	
v/c	**4.58**	**1.69**	0.33	0.07	0.33	0.02		
Queue	**Err**	**378.0**	0.0	0.0	0.0	0.0		
Scenario 1B - 2039 Future without Site PM Peak Hour (Page C-29)								
Delay	23.1	1.2	12.5	3.9	12.5	0.0	10.3	
v/c	0.58	0.50	0.64	0.15	0.64	0.03		
Queue	55.6	0.0	73.4	9.5	73.4	0.0		
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-47)								
Delay	23.4	1.2	15.2	4.7	15.2	0.1	12.1	
v/c	0.62	0.50	0.70	0.15	0.70	0.06		
Queue	70.2	0.0	90.5	11.1	89.9	0.0		

6.9 INT #8: REGENCY PARK DRIVE AT INTERNAL ROAD

Operational performance results for this intersection are provided in Table 10 for both the AM and PM peak hours for each of the analysis scenarios. Northbound and southbound left-turn lanes are included as warranted. Left turn lanes have been added to the internal street approaches (eastbound and westbound) based on intersection operations.

With STOP control on the side streets only, the Synchro analysis indicates the intersection is expected to exceed HRM acceptable limits with site generated trips. The maximum v/c ratio is projected to be 1.03 for the westbound left-turning movement during the PM peak hour with a delay of 156.5 seconds per vehicle. At HRM's request, the intersection was modeled as a signalized intersection and analysis indicates that it would operate well if signalized.

Table 10 – Intersection Capacity Analysis: Regency Park Drive at Internal Road

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement								Overall Intersection	
	Internal Street (EW)				Regency Park Drive					
	EB-LTR		WB-LTR		NB-L	NB-TR	SB-L	SB-TR	Delay	Control
Scenario 2 - 2039 Future with Site AM Peak Hour (Page C-39)										
Delay	23.9	10.1	23.8	10.2	7.9	0.0	7.9	0.0	7.3	2
v/c	0.27	0.09	0.35	0.13	0.03	0.13	0.06	0.15		
Queue	8.6	2.3	12.1	3.5	0.6	0.0	1.4	0.0		
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-48)										
Delay	151.4	10.7	156.5	11.8	8.2	0.0	8.7	0.0	28.2	2
v/c	0.95	0.13	1.03	0.20	0.06	0.22	0.14	0.20		
Queue	45.6	3.6	58.0	5.9	1.5	0.0	4.0	0.0		
Scenario 2A - 2039 Future with Site AM Peak Hour - **Signalized** (Page C-49)										
Delay	10.8	0.2	11.5	0.3	8.9	9.1	9.5	9.3	7.9	
v/c	0.20	0.08	0.28	0.12	0.06	0.26	0.14	0.30		
Queue	10.6	0.0	14.2	0.0	6.0	25.1	11.0	28.2		
Scenario 2 - 2039 Future with Site PM Peak Hour - **Signalized** (Page C-50)										
Delay	13.7	0.3	14.7	0.5	9.6	11.9	13.3	10.7	10.2	
v/c	0.30	0.11	0.37	0.17	0.18	0.53	0.42	0.48		
Queue	15.5	0.0	19.7	0.0	10.8	43.7	23.7	37.2		

While the analysis summarized in Table 10 has been completed as a stand-alone intersection, the proposed traffic signals on Washmill Lake Drive with the nearby development may provide additional gaps on Regency Park Drive and assist the left-turn movement from the Internal Streets. The intersection performance of ten 1-hour runs using *SimTraffic* software for the 2039 PM peak hour with site development is summarized in Table 11 with results included in Appendix C. SimTraffic analysis indicates that the planned nearby signals at the Washmill Lake Drive / Regency Park Drive intersection would create gaps in traffic flow and accommodate the movements from the Internal Street.

Table 11 – SimTraffic Analysis: Regency Park Drive at Internal Road

LOS Criteria	Control Delay (sec/veh) and 95th %ile Queue (m) by Intersection Movement								Overall Intersection	
	Internal Street (EW)				Regency Park Drive					
	EB-L	EB-TR	WB-L	WB-TR	NB-L	NB-TR	SB-L	SB-TR	Delay	Control
Scenario 2 - 2039 Future with Site PM Peak Hour (Page C-52)										
Delay	23.3	6.1	24.3	7.8	5.0	2.6	8.4	3.3	7.4	2
Queue	24.1	22.0	26.8	27.9	13.5	6.6	20.2	10.7		

7 SUMMARY & RECOMMENDATIONS

7.1 SUMMARY

Background	1. Plans are being prepared for a multi-use development consisting of 3,830 high-rise residential units and 155,665 square feet of ground floor retail space on vacant land north of the Bayers Lake Business Park in Halifax, Nova Scotia. Buildout of the development is expected by 2034.
Description of Existing Development	2. The proposed development area is on the vacant land bounded by Washmill Lake Drive and Thomas Raddall Drive.
Description of Proposed Development	3. The proposed development is expected to include 3,830 high-rise residential units and 155,665 square feet of ground floor retail space.
Proposed Site Access	4. The proposed development is along an extension of Regency Park Drive through to Washmill Lake Drive with several small accesses along the extended Regency Park Drive and Washmill Lake Drive.
Study Area Roads	5. The study considers Washmill Lake Drive, Regency Park Drive, Lacewood Drive, Dunbrack Street, and Parkland Drive.
Turning Movement Counts	6. Turning movement counts were collected by WSP on Wednesday, June 21, 2023 (PM peak period), and on Thursday, June 22, 2023 (AM peak period) for the Lacewood Drive at Parkland Drive/Regency Park Drive intersection. 7. Additional turning movement counts were collected at the Lacewood Drive intersections (study intersection 1, 3, and 4) on Tuesday, April 23, 2024 for the PM peak period and on Wednesday, April 24, 2024 for the AM peak period. 8. Further turning movement counts were collected at the Dunbrack Street intersections (study intersection 5, 6, and 7) on Tuesday, November 19, 2024 for the AM and PM peak periods.
Background Traffic Volumes	9. Projected 2039 peak hour future background volumes include an annual growth of 0.5% between 2023 and 2039. Projected 2039 traffic volumes consider trips generated by the new Bayers Lake Community Outpatient Centre separately. 10. Some background traffic in the current roadway network will be redistributed to the extension of Regency Park Drive. A separate volume scenario has been prepared that considers these redistributed background trips.
Estimation of Existing & Proposed Development Trips	11. Trip generation estimates for the proposed development were prepared using rates and equations published in *Trip Generation, 11th Edition* (Institute of Transportation Engineers, Washington, 2021). 12. Based on the proposed development's proximity to numerous amenities including planned transit routes and active transportation connections, many of the trips generated by the proposed development are anticipated to be non-auto trips. The methodology provided in *Trip Generation Handbook, 3rd Edition* (Institute of Transportation Engineers, Washington, 2017), for estimating total person trips generated by a development was applied with consideration of onsite synergies – trips that are made between complementary land uses within a single site, such as residential and retail uses.

Estimation of Existing & Proposed Development Trips (Cont)

13. Using the trip generation methodology outlined in *Trip Generation, 11th Edition*, and *Trip Generation Handbook, 3rd Edition*, it is estimated that the development will generate:
    - 1,415 two-way external person trips (516 entering and 899 exiting) during the AM peak hour; and,
    - 2,116 two-way external person trips (1,204 entering and 912 exiting) during the PM peak hour.

14. Person trips were assigned by travel mode considering existing and planned transit and active transportation corridors for this area as well as HRM's target non-auto modal split for the Inner Suburban area. The following modal splits for the site generated trips have been applied:
    - 65% auto driver;
    - 10% auto passenger;
    - 20% transit; and,
    - 5% active modes.

15. Based on the above, it is estimated that the development will generate:
    - 919 two-way vehicle trips (335 entering and 584 exiting) during the AM peak hour; and,
    - 1,376 two-way vehicle trips (783 entering and 593 exiting) during the PM peak hour.

Trip Distribution and Assignment

16. Proposed development generated trips were distributed to the Study Intersections based on counted volumes considering major trip origins and destinations in the region. Retail trips have been assigned considering regional residential development, while residential trips have been assigned considering employment densities and retail draws.

Warrant Analysis Summary

17. Warrant reviews were completed for left-turn lanes and traffic signals with the projected traffic volumes without and with site generated trips. Warrant results determined that:
    - An eastbound left turn lane will be warranted along Washmill Lake Drive at Regency Park Drive without and with site generated trips.
    - A westbound left turn lane will be warranted along Washmill Lake Drive at Regency Park Drive with site generated trips.
    - Northbound and southbound left turn lanes will be warranted along Regency Park Drive at Internal Road intersection with site generated trips.
    - Traffic signals will be warranted at Washmill Lake Drive at Regency Park Drive with site generated trips.
    - Traffic signals will be warranted at Dunbrack Street at Highway 102 Northbound Ramps without and with site generated trips.
    - Traffic signals will be warranted at Dunbrack Street at Highway 102 Southbound Ramps without and with site generated trips.

Summary – Intersection Capacity Analysis

18. Intersection performance analysis was completed using *Synchro 12* at the Study Intersections.

19. The **Lacewood Drive at Regency Park Drive/Parkland Drive intersection** is expected to operate well and within HRM acceptable limits during the AM and PM peak periods in all scenarios.

20. The **Washmill Lake Drive at Regency Park Drive intersection** is expected to operate well and within HRM acceptable limits with added turn lanes and traffic signalization, as warranted, during both the AM and PM peak periods.

21. The **Lacewood Drive at Highway 102 NB Ramps intersection** is expected to operate well and within NSPW guidelines during the AM and PM peak periods in all scenarios, apart from the northbound right turn movement whose v/c ratio is expected to reach 0.98 during the PM peak hour with the addition of site generated trips. Site generated trips are expected to have some impact to operations at this intersection.

22. The **Lacewood Drive at Highway 102 SB Ramps intersection** is expected to operate well and within NSPW guidelines during the AM and PM peak periods in all scenarios. Site generated trips are expected to have a negligible impact to operations.

23. The **Dunbrack Street at Washmill Lake Drive intersection** is expected to operate well and within HRM acceptable limits during the AM and PM peak periods in all scenarios. Site generated trips are expected to have some impact to operations.

24. The **Dunbrack Street at Highway 102 NB Ramps intersection** is expected to operate well and within NSPW guidelines during the AM and PM peak periods in all scenarios with traffic signalization, as warranted. Site generated trips are expected to have a negligible impact to operations.

25. The **Dunbrack Street at Highway 102 SB Ramps intersection** is expected to operate well and within NSPW guidelines during the AM and PM peak periods in all scenarios with traffic signalization, as warranted. Site generated trips are expected to have a negligible impact to operations.

26. The **Regency Park Drive at Internal Road intersection** would exceed HRM guidelines with added left turn lanes on each approach, however, SimTraffic analysis it would operate well under this scenario. It is expected that the planned signalization of the Washmill Lake Drive at Regency Park Drive intersection will create sufficient gaps in traffic along Regency Park Drive to accommodate side street traffic movements.

7.2 RECOMMENDATIONS

Recommend-ations

27. It is recommended that at the new Washmill Lake Drive at Regency Park Drive intersection:
    a) Install eastbound and westbound left turn lanes on Washmill Lake Drive when connection to Regency Park Drive is completed.
    b) Install traffic signals at the Washmill Lake Drive at Regency Park Drive intersection (warranted with site development).
28. It is recommended that at the new Regency Park Drive and Internal Road intersection:
    a) Install separate left turn lanes on each approach.
29. It is recommended that at both of the Dunbrack Street at Highway 102 Ramps intersections:
    a) Install traffic signals (warranted without and with site development).
30. Consideration should be given to lengthening the northbound left turn lane or providing dual northbound left turn lanes along Dunbrack Street for traffic turning to Washmill Lake Drive.
31. HRM and the developer should continue to plan for bicycle facilities along Regency Park Drive connecting Washmill Lake Drive to planned facilities along Parkland Drive.
32. Halifax Transit should continue to plan for transit routing along Regency Park Drive between Washmill Lake Drive and Lacewood Drive.

APPENDIX

A TRAFFIC VOLUME DATA

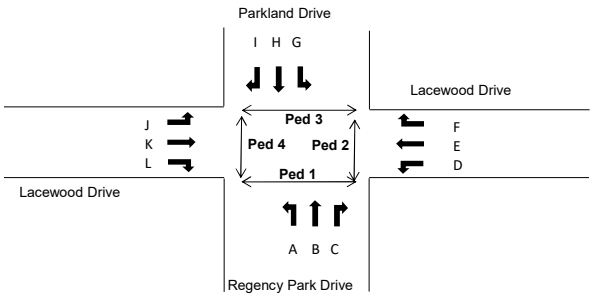
Table A-1

Lacewood Drive
@
Parkland Drive / Regency Park Drive

Halifax, NS

PM Peak: Wednesday, June 21, 2023

AM Peak: Thursday, June 22, 2023



AM Peak Period Volume Data

Time		Regency Park Drive Northbound Approach			Lacewood Drive Westbound Approach			Parkland Drive Southbound Approach			Lacewood Drive Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	24	5	21	24	36	4	41	9	39	13	39	11	266
07:15	07:30	15	7	28	12	39	6	33	13	20	13	56	12	254
07:30	07:45	17	10	36	22	52	4	39	7	44	19	64	12	326
07:45	08:00	27	8	21	27	63	14	32	7	33	25	85	23	365
08:00	08:15	28	9	25	35	57	15	38	13	36	25	68	23	372
08:15	08:30	21	2	29	23	71	29	36	11	33	22	69	32	378
08:30	08:45	22	9	43	17	48	22	27	23	29	17	83	41	381
08:45	09:00	38	8	13	18	83	30	21	17	47	17	75	41	408
AM Peak Hour		**109**	**28**	**110**	**93**	**259**	**96**	**122**	**64**	**145**	**81**	**295**	**137**	**1539**
07:00	**08:00**	**83**	**30**	**106**	**85**	**190**	**28**	**145**	**36**	**136**	**70**	**244**	**58**	**1211**
08:00	**09:00**	**109**	**28**	**110**	**93**	**259**	**96**	**122**	**64**	**145**	**81**	**295**	**137**	**1539**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
07:00	**08:00**	**8**			**5**			**4**			**10**			**27**
08:00	**09:00**	**13**			**9**			**19**			**15**			**56**

PM Peak Period Volume Data

Time		Regency Park Drive Northbound Approach			Lacewood Drive Westbound Approach			Parkland Drive Southbound Approach			Lacewood Drive Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
16:00	16:15	49	25	28	43	135	30	31	21	48	67	113	39	629
16:15	16:30	34	22	23	42	114	27	27	16	39	56	123	40	563
16:30	16:45	35	16	35	41	108	36	28	22	36	57	123	41	578
16:45	17:00	36	10	25	34	119	37	26	22	47	52	139	62	609
17:00	17:15	50	8	44	24	134	28	33	22	35	53	145	62	638
17:15	17:30	39	9	25	25	130	26	20	12	41	63	109	40	539
17:30	17:45	42	11	27	36	130	42	38	16	40	49	159	59	649
17:45	18:00	26	12	20	22	98	23	33	26	27	69	148	58	562
PM Peak Hour		**167**	**38**	**121**	**119**	**513**	**133**	**117**	**72**	**163**	**217**	**552**	**223**	**2435**
16:00	**17:00**	**154**	**73**	**111**	**160**	**476**	**130**	**112**	**81**	**170**	**232**	**498**	**182**	**2379**
17:00	**18:00**	**157**	**40**	**116**	**107**	**492**	**119**	**124**	**76**	**143**	**234**	**561**	**219**	**2388**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
16:00	**17:00**	**19**			**6**			**23**			**10**			**58**
17:00	**18:00**	**17**			**3**			**12**			**14**			**46**

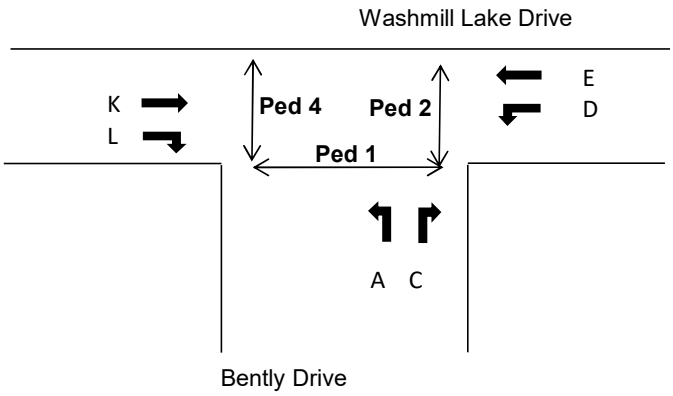
Table A-2

Washmill Lake Drive
@
Bently Drive

Halifax, NS

PM Peak: Wednesday, June 21, 2023

AM Peak: Thursday, June 22, 2023



AM Peak Period Volume Data

Time		Bently Drive Northbound Approach		Washmill Lake Drive Westbound Approach		Washmill Lake Drive Eastbound Approach		Total Vehicles
		A	C	D	E	K	L	
07:00	07:15	3	20	3	65	63	2	156
07:15	07:30	2	14	4	89	58	2	169
07:30	07:45	2	25	6	79	55	0	167
07:45	08:00	4	15	8	122	80	2	231
08:00	08:15	5	27	8	102	86	2	230
08:15	08:30	7	18	11	112	80	6	234
08:30	08:45	4	25	5	118	88	3	243
08:45	09:00	3	8	8	126	64	3	212
AM Peak Hour		**20**	**85**	**32**	**454**	**334**	**13**	**938**
07:00	**08:00**	**11**	**74**	**21**	**355**	**256**	**6**	**723**
08:00	**09:00**	**19**	**78**	**32**	**458**	**318**	**14**	**919**
		Ped 1		**Ped 2**		**Ped 4**		**Total Peds**
07:00	**08:00**	**7**		**4**		**0**		**11**
08:00	**09:00**	**6**		**5**		**0**		**11**

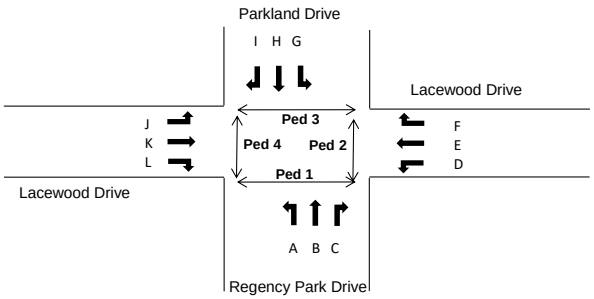
PM Peak Period Volume Data

Time		Bently Drive Northbound Approach		Washmill Lake Drive Westbound Approach		Washmill Lake Drive Eastbound Approach		Total Vehicles
		A	C	D	E	K	L	
16:00	16:15	4	11	15	158	174	8	370
16:15	16:30	3	7	16	161	150	5	342
16:30	16:45	4	16	10	161	181	6	378
16:45	17:00	3	8	20	174	199	9	413
17:00	17:15	4	10	21	153	219	9	416
17:15	17:30	4	13	19	147	169	7	359
17:30	17:45	3	13	17	144	163	13	353
17:45	18:00	5	18	14	170	147	8	362
PM Peak Hour		**15**	**47**	**70**	**635**	**768**	**31**	**1566**
16:00	**17:00**	**14**	**42**	**61**	**654**	**704**	**28**	**1503**
17:00	**18:00**	**16**	**54**	**71**	**614**	**698**	**37**	**1490**
		Ped 1		**Ped 2**		**Ped 4**		**Total Peds**
16:00	**17:00**	**5**		**1**		**0**		**6**
17:00	**18:00**	**2**		**3**		**0**		**5**

Table A-3

Lacewood Drive
@
Parkland Drive/Regency Park Drive

Halifax, NS
PM Peak: Tuesday, April 23, 2024
AM Peak: Wednesday, April 24, 2024



AM Peak Period Volume Data

Time		Regency Park Drive Northbound Approach			Lacewood Drive Westbound Approach			Parkland Drive Southbound Approach			Lacewood Drive Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	14	5	31	6	40	14	33	5	39	15	48	16	266
07:15	07:30	19	3	21	8	51	22	26	12	31	19	60	16	288
07:30	07:45	17	11	20	18	63	22	31	6	37	24	91	15	355
07:45	08:00	20	11	33	23	76	25	45	18	36	19	107	20	433
08:00	08:15	33	12	33	13	63	29	52	16	47	24	108	29	459
08:15	08:30	34	10	33	24	89	20	44	8	29	26	116	33	466
08:30	08:45	26	12	24	25	68	17	19	20	30	21	105	43	410
08:45	09:00	18	21	6	26	83	18	28	24	38	67	76	9	414
AM Peak Hour		**113**	**45**	**123**	**85**	**296**	**91**	**160**	**62**	**142**	**90**	**436**	**125**	**1768**
07:00	**08:00**	**70**	**30**	**105**	**55**	**230**	**83**	**135**	**41**	**143**	**77**	**306**	**67**	**1342**
08:00	**09:00**	**111**	**55**	**96**	**88**	**303**	**84**	**143**	**68**	**144**	**138**	**405**	**114**	**1749**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
07:00	**08:00**	**8**			**5**			**9**			**7**			**29**
08:00	**09:00**	**11**			**6**			**12**			**7**			**36**

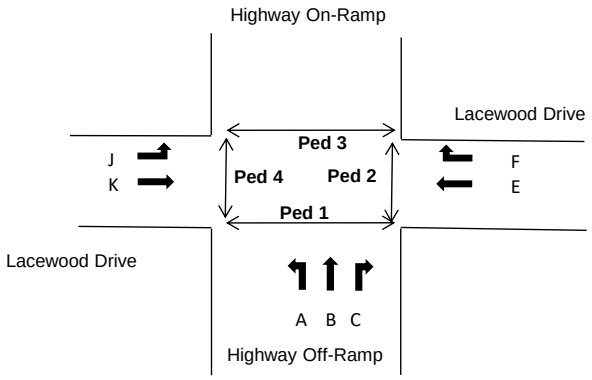
PM Peak Period Volume Data

Time		Regency Park Drive Northbound Approach			Lacewood Drive Westbound Approach			Parkland Drive Southbound Approach			Lacewood Drive Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
16:00	16:15	49	22	24	41	134	32	28	16	38	77	131	36	628
16:15	16:30	46	28	30	36	130	49	30	15	52	65	146	47	674
16:30	16:45	33	22	27	39	121	39	35	17	34	69	139	41	616
16:45	17:00	26	16	8	42	146	24	37	26	39	70	152	25	611
17:00	17:15	26	17	29	26	150	43	29	19	48	62	120	38	607
17:15	17:30	27	16	16	50	134	41	28	19	41	69	169	45	655
17:30	17:45	32	14	30	28	106	28	35	13	51	64	161	53	615
17:45	18:00	41	23	19	42	131	38	37	18	45	36	151	58	639
PM Peak Hour		**154**	**88**	**89**	**158**	**531**	**144**	**130**	**74**	**163**	**281**	**568**	**149**	**2529**
16:00	**17:00**	**154**	**88**	**89**	**158**	**531**	**144**	**130**	**74**	**163**	**281**	**568**	**149**	**2529**
17:00	**18:00**	**126**	**70**	**94**	**146**	**521**	**150**	**129**	**69**	**185**	**231**	**601**	**194**	**2516**
		Ped 1			**Ped 2**			**Ped 3**			**Ped 4**			**Total Peds**
16:00	**17:00**	**7**			**12**			**22**			**12**			**53**
17:00	**18:00**	**8**			**15**			**22**			**16**			**61**

Table A-4

Lacewood Drive
@
Highway 102 NB Ramps

Halifax, NS
PM Peak: Tuesday, April 23, 2024
AM Peak: Wednesday, April 24, 2024



AM Peak Period Volume Data

Time		Highway Off-Ramp Northbound Approach			Lacewood Drive Westbound Approach		Highway On-Ramp Southbound Approach	Lacewood Drive Eastbound Approach		Total Vehicles
		A	B	C	E	F		J	K	
07:00	07:15	10	0	48	90	26		17	50	241
07:15	07:30	14	0	47	106	39		26	71	303
07:30	07:45	17	0	78	102	47		26	98	368
07:45	08:00	15	0	72	130	47		29	117	410
08:00	08:15	14	0	75	129	54		23	114	409
08:15	08:30	22	0	79	119	60		50	135	465
08:30	08:45	29	0	98	123	51		45	130	476
08:45	09:00	46	1	108	166	54		58	124	557
AM Peak Hour		**111**	**1**	**360**	**537**	**219**	**0**	**176**	**503**	**1907**
07:00	**08:00**	**56**	**0**	**245**	**428**	**159**	**0**	**98**	**336**	**1322**
08:00	**09:00**	**111**	**1**	**360**	**537**	**219**	**0**	**176**	**503**	**1907**
		Ped 1			**Ped 2**		**Ped 3**	**Ped 4**		**Total Peds**
07:00	**08:00**	**8**			**0**		**0**	**0**		**8**
08:00	**09:00**	**3**			**0**		**0**	**0**		**3**

PM Peak Period Volume Data

Time		Highway Off-Ramp Northbound Approach			Lacewood Drive Westbound Approach		Highway On-Ramp Southbound Approach	Lacewood Drive Eastbound Approach		Total Vehicles
		A	B	C	E	F		J	K	
16:00	16:15	69	1	89	239	89		210	216	913
16:15	16:30	73	1	107	250	56		216	226	929
16:30	16:45	63	0	97	230	69		153	239	851
16:45	17:00	78	1	74	223	68		152	217	813
17:00	17:15	68	0	82	209	66		170	214	809
17:15	17:30	53	1	102	210	59		205	274	904
17:30	17:45	62	0	88	184	77		133	252	796
17:45	18:00	48	1	102	231	64		111	228	785
PM Peak Hour		**283**	**3**	**367**	**942**	**282**	**0**	**731**	**898**	**3506**
16:00	**17:00**	**283**	**3**	**367**	**942**	**282**	**0**	**731**	**898**	**3506**
17:00	**18:00**	**231**	**2**	**374**	**834**	**266**	**0**	**619**	**968**	**3294**
		Ped 1			**Ped 2**		**Ped 3**	**Ped 4**		**Total Peds**
16:00	**17:00**	**12**			**0**		**0**	**0**		**12**
17:00	**18:00**	**17**			**0**		**1**	**0**		**18**

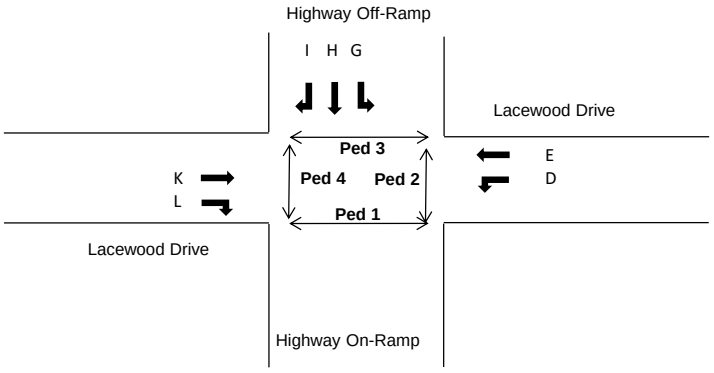
Table A-5

Lacewood Drive
@
Highway 102 SB Ramps

Halifax, NS

Midday, PM Peaks: Tuesday, April 23, 2024

AM Peak: Wednesday, April 24, 2024



AM Peak Period Volume Data

Time		Highway On-Ramp Northbound Approach	Lacewood Drive Westbound Approach		Highway Off-Ramp Southbound Approach			Lacewood Drive Eastbound Approach		Total Vehicles
			D	E	G	H	I	K	L	
07:00	07:15		60	48	28	0	70	50	2	258
07:15	07:30		56	57	40	0	85	54	6	298
07:30	07:45		44	75	64	0	91	87	2	363
07:45	08:00		41	125	64	1	152	77	14	474
08:00	08:15		52	93	67	0	114	74	18	418
08:15	08:30		49	96	77	0	96	117	9	444
08:30	08:45		44	106	74	0	123	117	18	482
08:45	09:00		57	144	59	0	141	101	15	517
AM Peak Hour		**0**	**202**	**439**	**277**	**0**	**474**	**409**	**60**	**1861**
07:00	**08:00**	**0**	**201**	**305**	**196**	**1**	**398**	**268**	**24**	**1393**
08:00	**09:00**	**0**	**202**	**439**	**277**	**0**	**474**	**409**	**60**	**1861**
		Ped 1	**Ped 2**		**Ped 3**			**Ped 4**		**Total Peds**
07:00	**08:00**	**5**	**1**		**0**			**0**		**6**
08:00	**09:00**	**3**	**0**		**0**			**0**		**3**

Midday Peak Period Volume Data

Time		Highway On-Ramp Northbound Approach	Lacewood Drive Westbound Approach		Highway Off-Ramp Southbound Approach			Lacewood Drive Eastbound Approach		Total Vehicles
			D	E	G	H	I	K	L	
11:30	11:45		68	236	42	0	151	288	77	862
11:45	12:00		87	266	51	0	120	231	70	825
12:00	12:15		106	278	39	0	144	248	76	891
12:15	12:30		70	246	72	1	154	272	74	889
12:30	12:45		70	219	52	0	143	316	103	903
12:45	13:00		65	230	33	0	131	289	84	832
13:00	13:15		65	231	49	0	128	265	88	826
13:15	13:30		68	242	37	1	115	315	71	849
Midday Peak Hour		**0**	**311**	**973**	**196**	**1**	**572**	**1125**	**337**	**3515**
11:30	**12:30**	**0**	**331**	**1026**	**204**	**1**	**569**	**1039**	**297**	**3467**
12:30	**13:30**	**0**	**268**	**922**	**171**	**1**	**517**	**1185**	**346**	**3410**
		Ped 1	**Ped 2**		**Ped 3**			**Ped 4**		**Total Peds**
11:30	**12:30**	**15**	**0**		**0**			**0**		**15**
12:30	**13:30**	**11**	**0**		**0**			**0**		**11**

PM Peak Period Volume Data

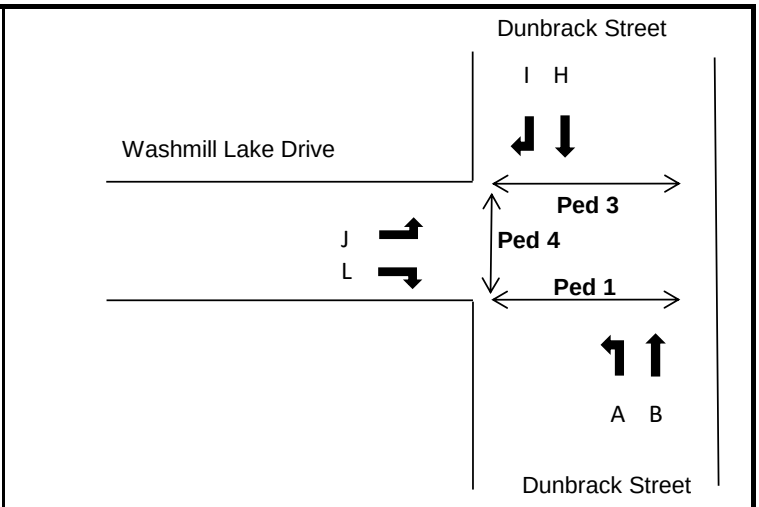
Time		Highway On-Ramp Northbound Approach	Lacewood Drive Westbound Approach		Highway Off-Ramp Southbound Approach			Lacewood Drive Eastbound Approach		Total Vehicles
			D	E	G	H	I	K	L	
16:00	16:15		67	234	65	0	108	401	62	937
16:15	16:30		94	220	69	0	129	345	72	929
16:30	16:45		88	246	64	0	122	308	69	897
16:45	17:00		75	190	64	0	134	347	74	884
17:00	17:15		69	214	73	0	87	304	77	824
17:15	17:30		94	167	100	0	136	371	87	955
17:30	17:45		56	189	79	0	115	297	82	818
17:45	18:00		85	220	72	0	102	251	59	789
PM Peak Hour		**0**	**324**	**890**	**262**	**0**	**493**	**1401**	**277**	**3647**
16:00	**17:00**	**0**	**324**	**890**	**262**	**0**	**493**	**1401**	**277**	**3647**
17:00	**18:00**	**0**	**304**	**790**	**324**	**0**	**440**	**1223**	**305**	**3386**
		Ped 1	**Ped 2**		**Ped 3**			**Ped 4**		**Total Peds**
16:00	**17:00**	**12**	**0**		**0**			**0**		**12**
17:00	**18:00**	**9**	**0**		**0**			**0**		**9**

Table A-6

Dunbrack Street @ Washmill Lake Drive

Halifax, NS

Tuesday, November 19, 2024



AM Peak Period Volume Data

Time		Dunbrack Street Northbound Approach		Dunbrack Street Southbound Approach		Washmill Lake Drive Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
07:00	07:15	30	165	93	6	9	51	354
07:15	07:30	59	204	99	4	6	87	459
07:30	07:45	42	173	112	6	7	79	419
07:45	08:00	100	216	136	6	6	93	557
08:00	08:15	77	180	117	11	8	75	468
08:15	08:30	72	161	146	17	13	77	486
08:30	08:45	67	140	139	12	7	60	425
08:45	09:00	85	151	106	6	9	64	421
AM Peak Hour		**316**	**697**	**538**	**46**	**34**	**305**	**1936**
07:00	**08:00**	**231**	**758**	**440**	**22**	**28**	**310**	**1789**
08:00	**09:00**	**301**	**632**	**508**	**46**	**37**	**276**	**1800**
		Ped 1		**Ped 3**		**Ped 4**		**Total Peds**
07:00	**08:00**	**26**		**16**		**3**		**45**
08:00	**09:00**	**59**		**40**		**1**		**100**

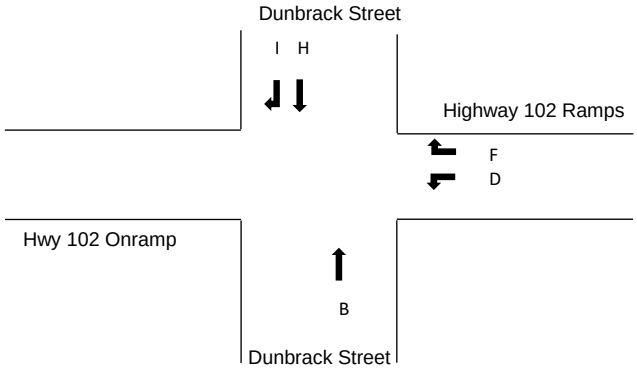
PM Peak Period Volume Data

Time		Dunbrack Street Northbound Approach		Dunbrack Street Southbound Approach		Washmill Lake Drive Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
16:00	16:15	99	191	176	17	15	127	625
16:15	16:30	102	187	188	15	19	126	637
16:30	16:45	103	171	235	24	10	127	670
16:45	17:00	138	180	171	19	15	99	622
17:00	17:15	116	166	178	16	15	123	614
17:15	17:30	121	181	169	17	13	115	616
17:30	17:45	107	177	159	15	4	85	547
17:45	18:00	120	179	114	12	14	79	518
PM Peak Hour		**442**	**729**	**770**	**75**	**59**	**479**	**2554**
16:00	**17:00**	**442**	**729**	**770**	**75**	**59**	**479**	**2554**
17:00	**18:00**	**464**	**703**	**620**	**60**	**46**	**402**	**2295**
		Ped 1		**Ped 3**		**Ped 4**		**Total Peds**
16:00	**17:00**	**0**		**8**		**0**		**8**
17:00	**18:00**	**0**		**5**		**0**		**5**

Table A-7

Dunbrack Street
@
Highway 102 NB Ramps (Toward Bedford)

Halifax, NS
Tuesday, November 19, 2024



AM Peak Period Volume Data

Time		Dunbrack Street Northbound Approach	Highway 102 Ramps Westbound Approach		Dunbrack Street Southbound Approach		Hwy 102 Onramp Eastbound Approach			Total Vehicles
		B	D	F	H	I				
07:00	07:15	176	17	26	99	49				367
07:15	07:30	227	20	26	136	57				466
07:30	07:45	195	19	33	137	67				451
07:45	08:00	267	19	38	146	66				536
08:00	08:15	206	30	43	138	49				466
08:15	08:30	189	34	46	156	66				491
08:30	08:45	174	22	42	140	54				432
08:45	09:00	177	33	52	127	44				433
AM Peak Hour		**857**	**102**	**160**	**577**	**248**	**0**	**0**	**0**	**1944**
07:00	**08:00**	**865**	**75**	**123**	**518**	**239**	**0**	**0**	**0**	**1820**
08:00	**09:00**	**746**	**119**	**183**	**561**	**213**	**0**	**0**	**0**	**1822**

Midday Peak Period Volume Data

Time		Dunbrack Street Northbound Approach	Highway 102 Ramps Westbound Approach		Dunbrack Street Southbound Approach		Hwy 102 Onramp Eastbound Approach			Total Vehicles
		B	D	F	H	I				
11:30	11:45	122	37	90	157	44				450
11:45	12:00	149	31	84	157	42				463
12:00	12:15	154	30	80	148	45				457
12:15	12:30	141	42	76	162	53				474
12:30	12:45	124	26	72	174	41				437
12:45	13:00	152	33	86	154	48				473
13:00	13:15	140	27	78	169	54				468
13:15	13:30	126	30	58	152	51				417
Midday Peak Hour		**557**	**128**	**312**	**659**	**196**	**0**	**0**	**0**	**1852**
11:30	**12:30**	**566**	**140**	**330**	**624**	**184**	**0**	**0**	**0**	**1844**
12:30	**13:30**	**542**	**116**	**294**	**649**	**194**	**0**	**0**	**0**	**1795**

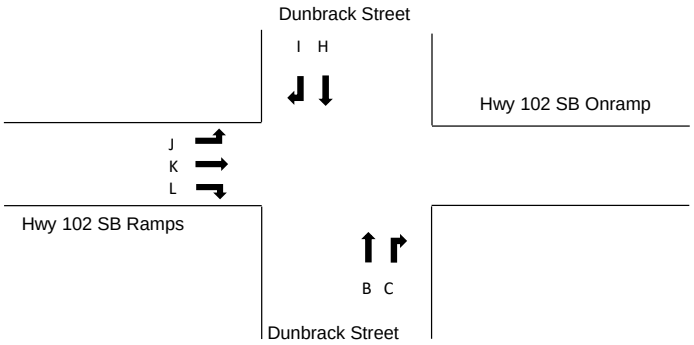
PM Peak Period Volume Data

Time		Dunbrack Street Northbound Approach	Highway 102 Ramps Westbound Approach		Dunbrack Street Southbound Approach		Hwy 102 Onramp Eastbound Approach			Total Vehicles
		B	D	F	H	I	J	K	L	
16:00	16:15	185	53	100	225	88				651
16:15	16:30	212	62	79	240	80				673
16:30	16:45	187	66	108	255	94				710
16:45	17:00	219	47	108	195	76				645
17:00	17:15	178	67	99	234	66				644
17:15	17:30	195	40	107	213	68				623
17:30	17:45	176	47	100	177	54				554
17:45	18:00	179	32	120	159	42				532
PM Peak Hour		**803**	**228**	**395**	**915**	**338**	**0**	**0**	**0**	**2679**
16:00	**17:00**	**803**	**228**	**395**	**915**	**338**	**0**	**0**	**0**	**2679**
17:00	**18:00**	**728**	**186**	**426**	**783**	**230**	**0**	**0**	**0**	**2353**

Table A-8

Dunbrack Street
@
Highway 102 SB Ramps (From Bedford)

Halifax, NS
Tuesday, November 19, 2024



AM Peak Period Volume Data

Time		Dunbrack Street Northbound Approach		Hwy 102 SB Onramp Westbound Approach			Dunbrack Street Southbound Approach		Hwy 102 SB Ramps Eastbound Approach			Total Vehicles
		B	C				H	I	J	K	L	
07:00	07:15	152	124				54	25	86	21	124	586
07:15	07:30	195	134				63	10	86	16	219	723
07:30	07:45	208	136				79	6	75	11	194	709
07:45	08:00	246	96				98	8	82	6	173	709
08:00	08:15	234	109				98	7	101	6	153	708
08:15	08:30	230	72				123	6	67	3	143	644
08:30	08:45	208	69				114	2	67	3	113	576
08:45	09:00	240	48				109	3	53	0	89	542
AM Peak Hour		**883**	**475**	**0**	**0**	**0**	**338**	**31**	**344**	**39**	**739**	**2849**
07:00	**08:00**	**801**	**490**	**0**	**0**	**0**	**294**	**49**	**329**	**54**	**710**	**2727**
08:00	**09:00**	**912**	**298**	**0**	**0**	**0**	**444**	**18**	**288**	**12**	**498**	**2470**

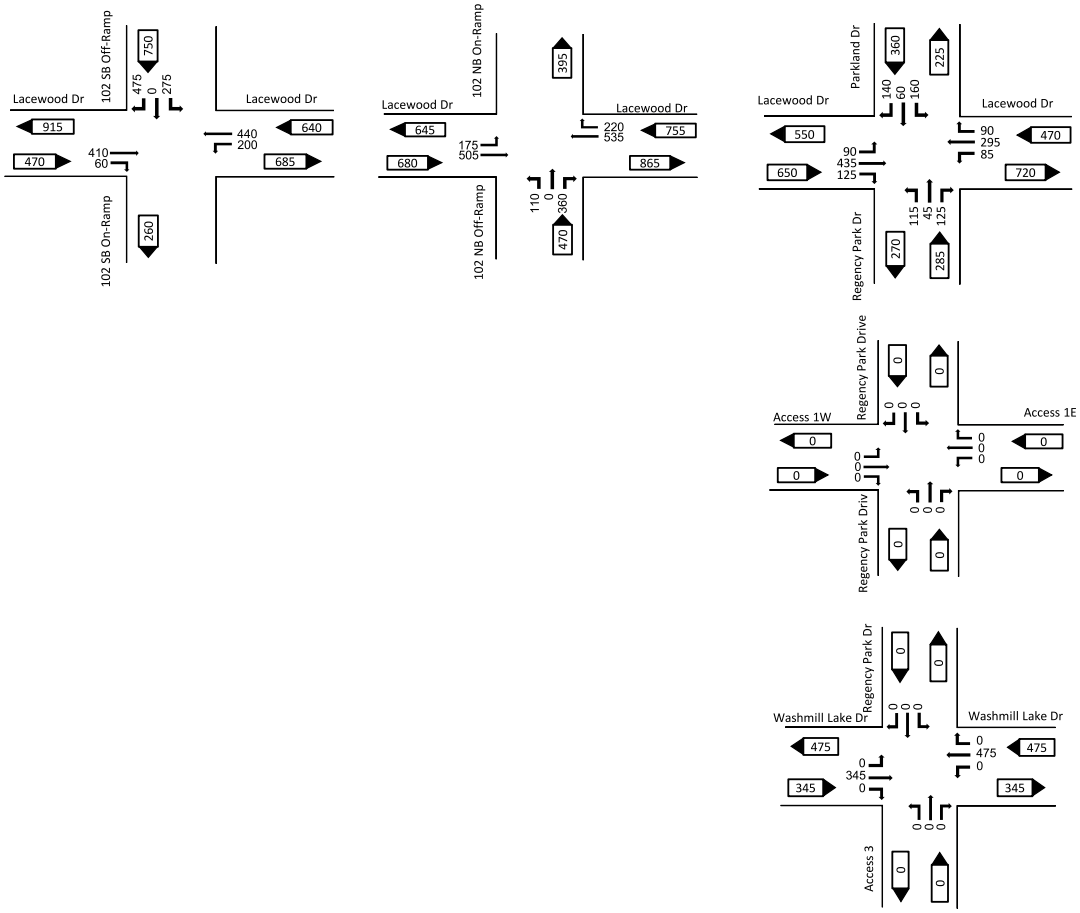
Midday Peak Period Volume Data

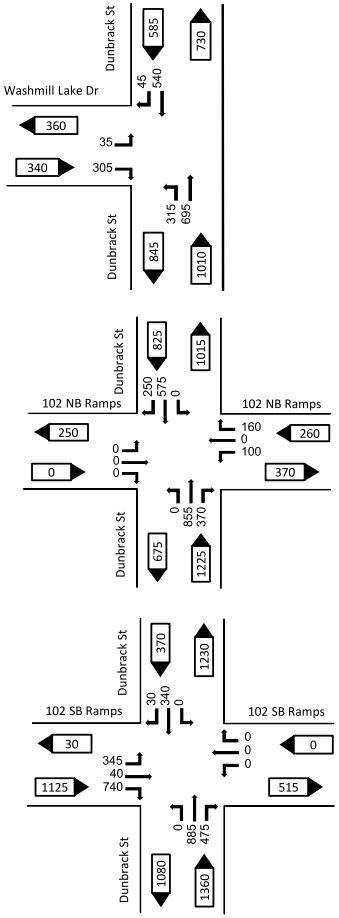
Time		Dunbrack Street Northbound Approach		Hwy 102 SB Onramp Westbound Approach			Dunbrack Street Southbound Approach		Hwy 102 SB Ramps Eastbound Approach			Total Vehicles
		B	C				H	I	J	K	L	
11:30	11:45	170	18				153	2	25	0	71	439
11:45	12:00	146	42				135	2	45	0	70	440
12:00	12:15	186	26				128	2	38	1	76	457
12:15	12:30	168	23				156	2	32	1	74	456
12:30	12:45	156	41				143	2	37	0	73	452
12:45	13:00	178	27				128	1	41	1	85	461
13:00	13:15	186	18				132	0	22	0	60	418
13:15	13:30	155	28				129	3	39	0	70	424
Midday Peak Hour		**688**	**117**	**0**	**0**	**0**	**555**	**7**	**148**	**3**	**308**	**1826**
11:30	**12:30**	**670**	**109**	**0**	**0**	**0**	**572**	**8**	**140**	**2**	**291**	**1792**
12:30	**13:30**	**675**	**114**	**0**	**0**	**0**	**532**	**6**	**139**	**1**	**288**	**1755**

PM Peak Period Volume Data

Time		Dunbrack Street Northbound Approach		Hwy 102 SB Onramp Westbound Approach			Dunbrack Street Southbound Approach		Hwy 102 SB Ramps Eastbound Approach			Total Vehicles
		B	C				H	I	J	K	L	
16:00	16:15	276	23				205	0	51	0	151	706
16:15	16:30	255	32				253	0	63	0	165	768
16:30	16:45	232	27				257	0	66	0	150	732
16:45	17:00	251	20				190	0	72	1	204	738
17:00	17:15	214	22				252	30	38	1	161	718
17:15	17:30	217	21				206	39	53	0	155	691
17:30	17:45	206	14				178	30	46	0	147	621
17:45	18:00	191	14				149	29	41	0	118	542
PM Peak Hour		**952**	**101**	**0**	**0**	**0**	**952**	**30**	**239**	**2**	**680**	**2956**
16:00	**17:00**	**1014**	**102**	**0**	**0**	**0**	**905**	**0**	**252**	**1**	**670**	**2944**
17:00	**18:00**	**828**	**71**	**0**	**0**	**0**	**785**	**128**	**178**	**1**	**581**	**2572**

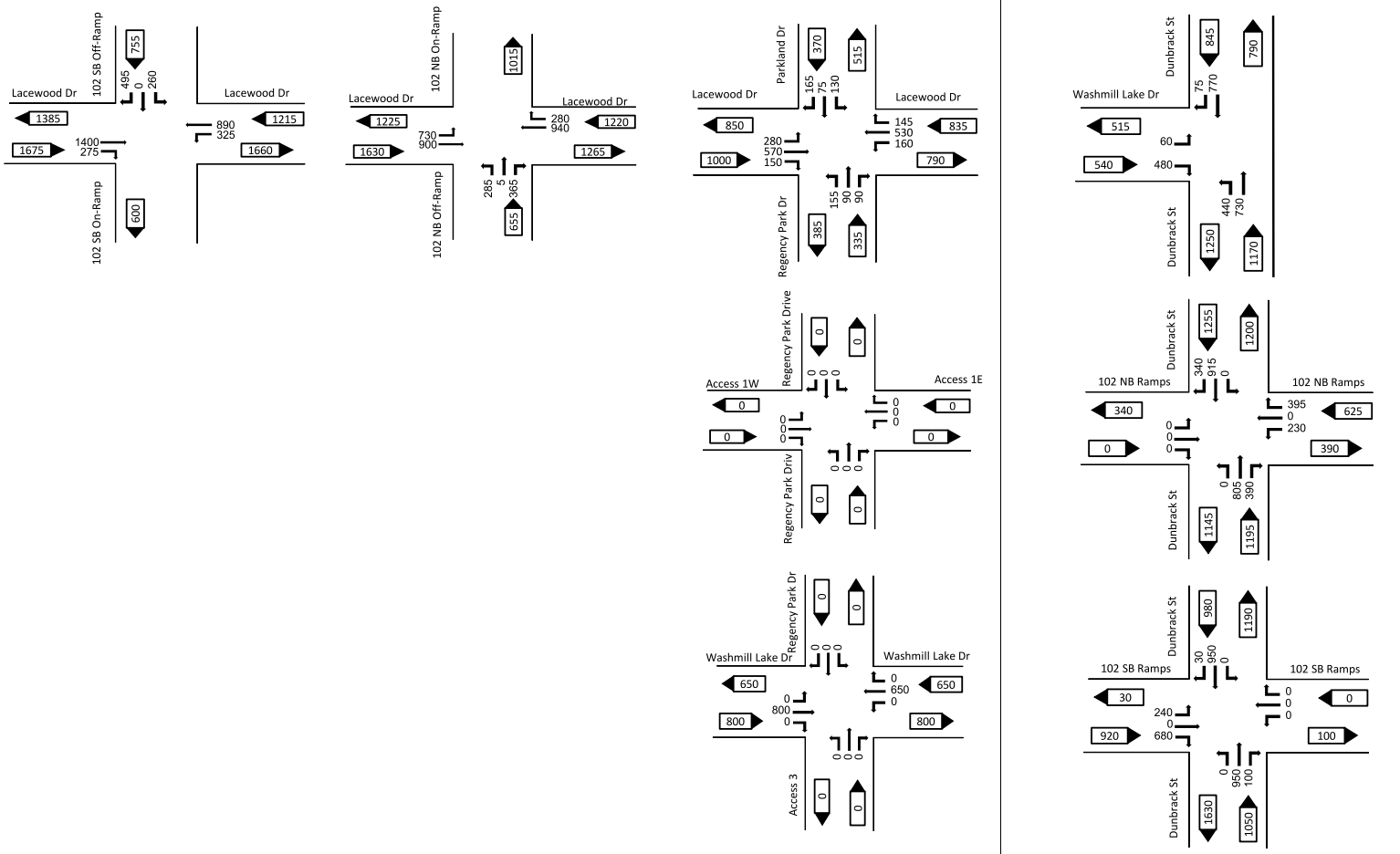
Weekday AM Peak Hour
2024 Existing Traffic Volumes





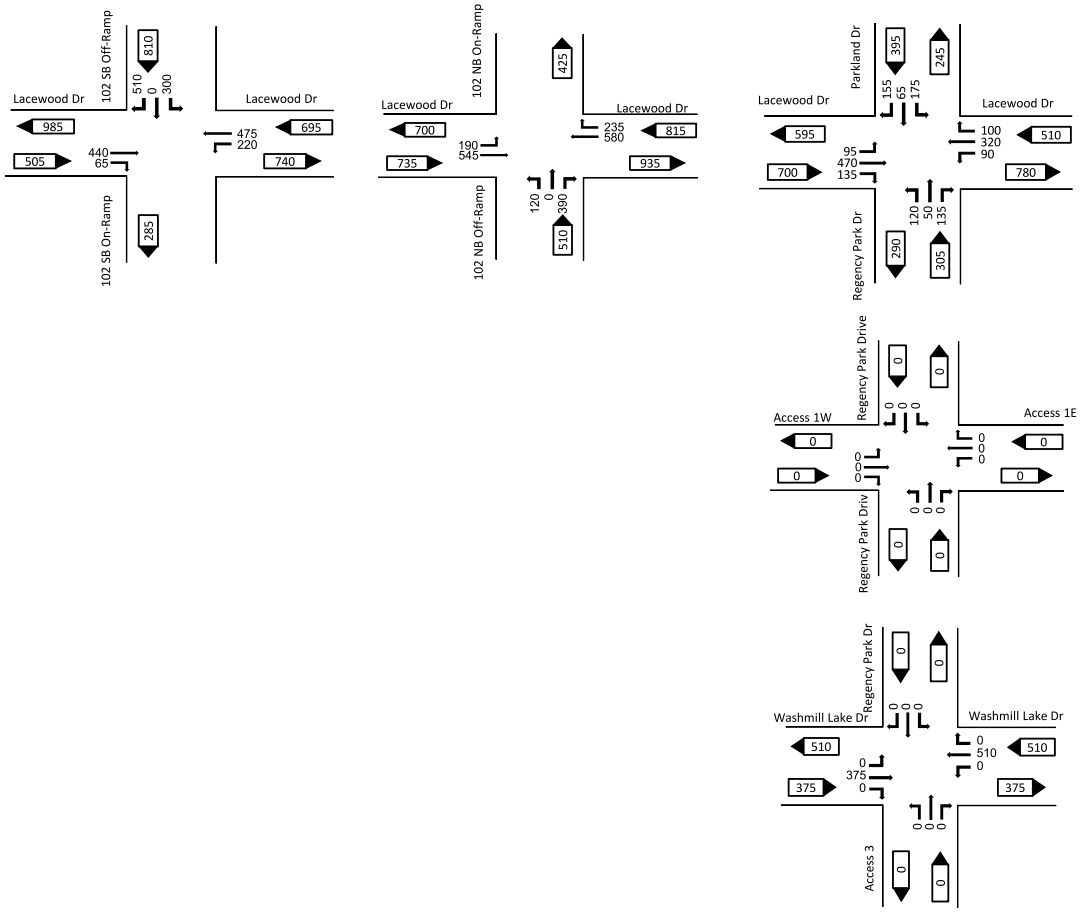
wsp	Regency Links Halifax, NS	Figure A-1A
	Weekday AM Peak Hour 2024 Existing Traffic Volumes	February 2025

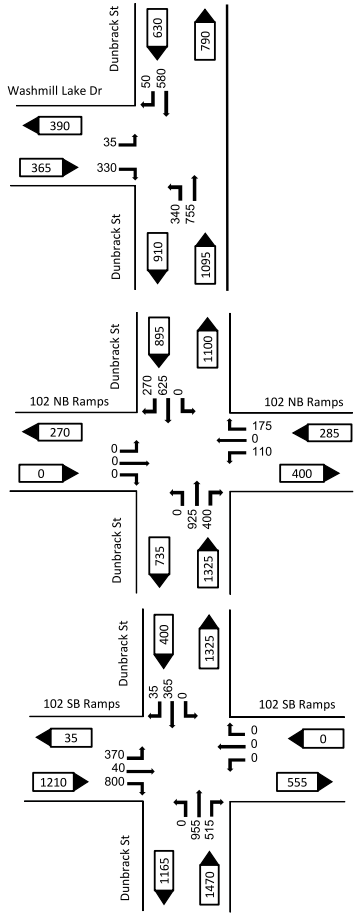
Weekday PM Peak Hour
2024 Existing Traffic Volumes



wsp	Regency Links Halifax, NS	Figure A-1B
	Weekday PM Peak Hour 2024 Existing Traffic Volumes	February 2025

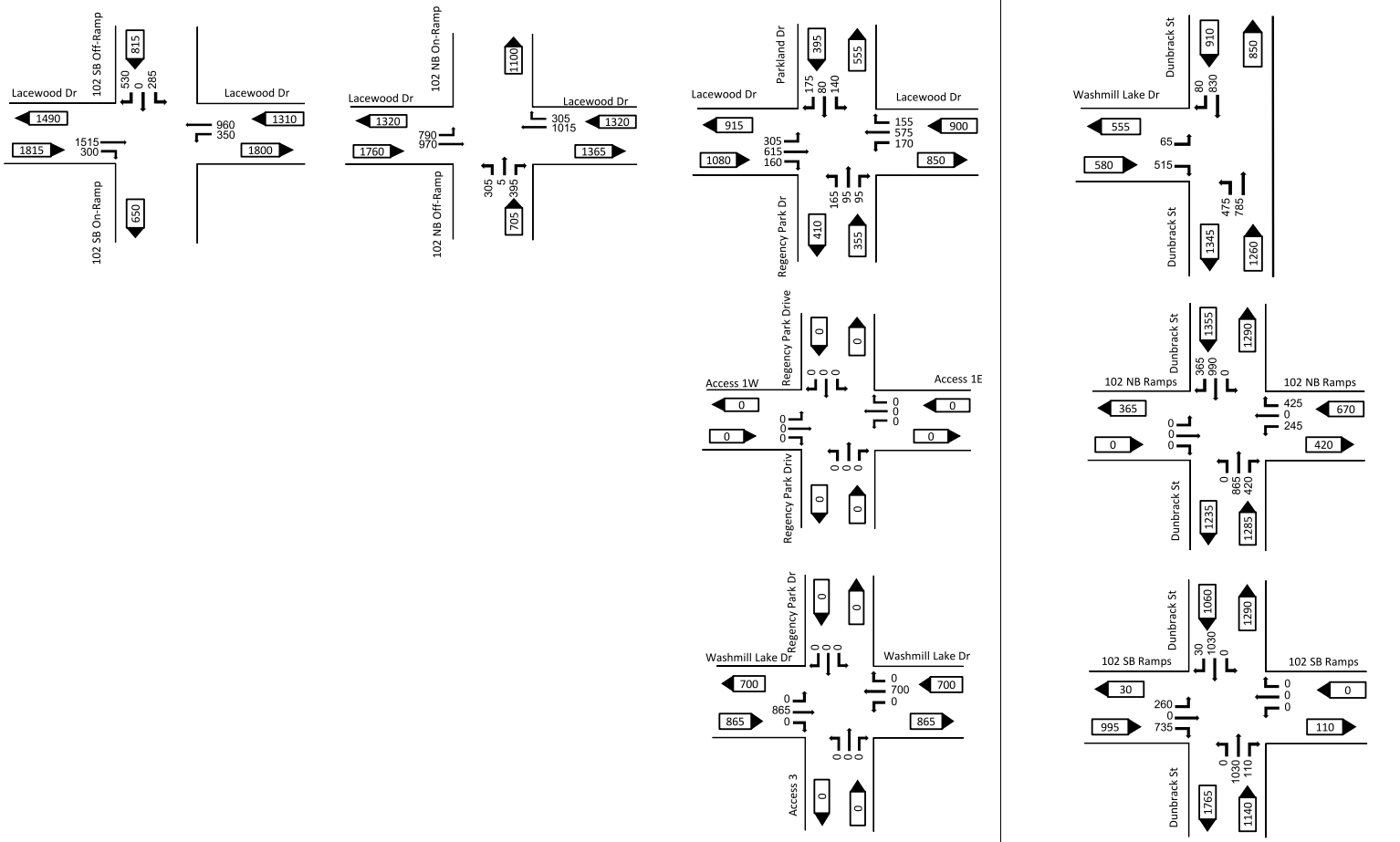
Weekday AM Peak Hour
2039 Future Background Traffic Volumes





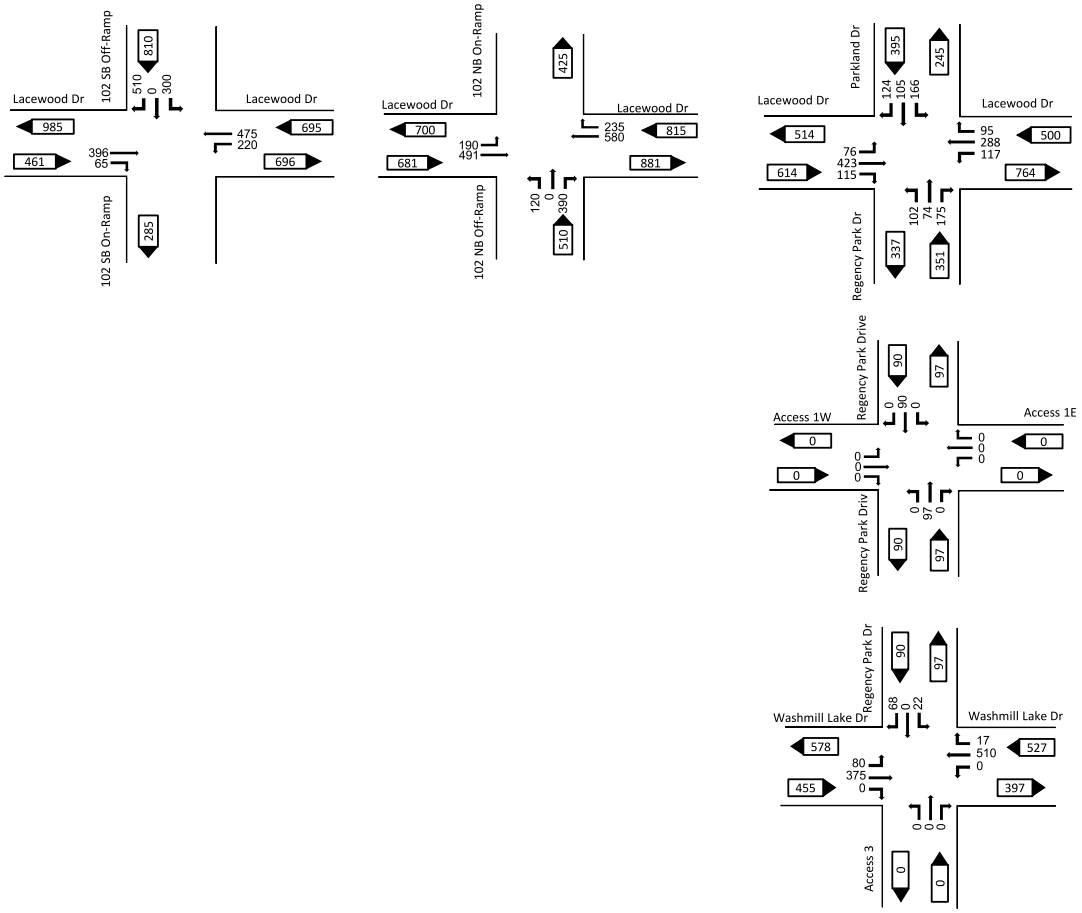
wsp	Regency Links Halifax, NS	Figure A-2A
	Weekday AM Peak Hour 2039 Future Background Traffic Volumes	February 2025

Weekday PM Peak Hour
2039 Future Background Traffic Volumes



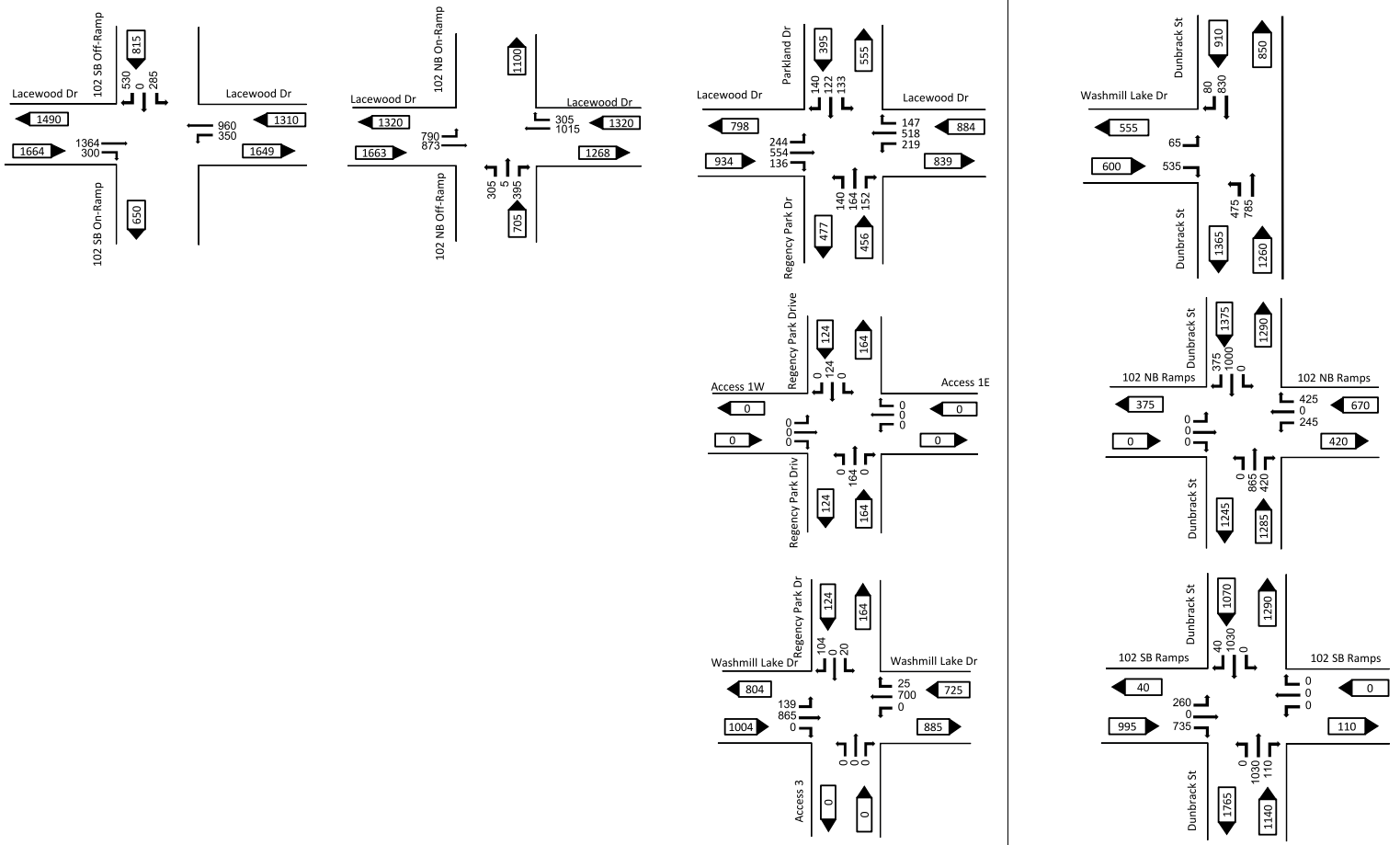
wsp	Regency Links Halifax, NS	Figure A-2B
	Weekday PM Peak Hour 2039 Future Background Traffic Volumes	February 2025

Weekday AM Peak Hour
2039 Future Background Traffic
Volumes -Diverted Trips



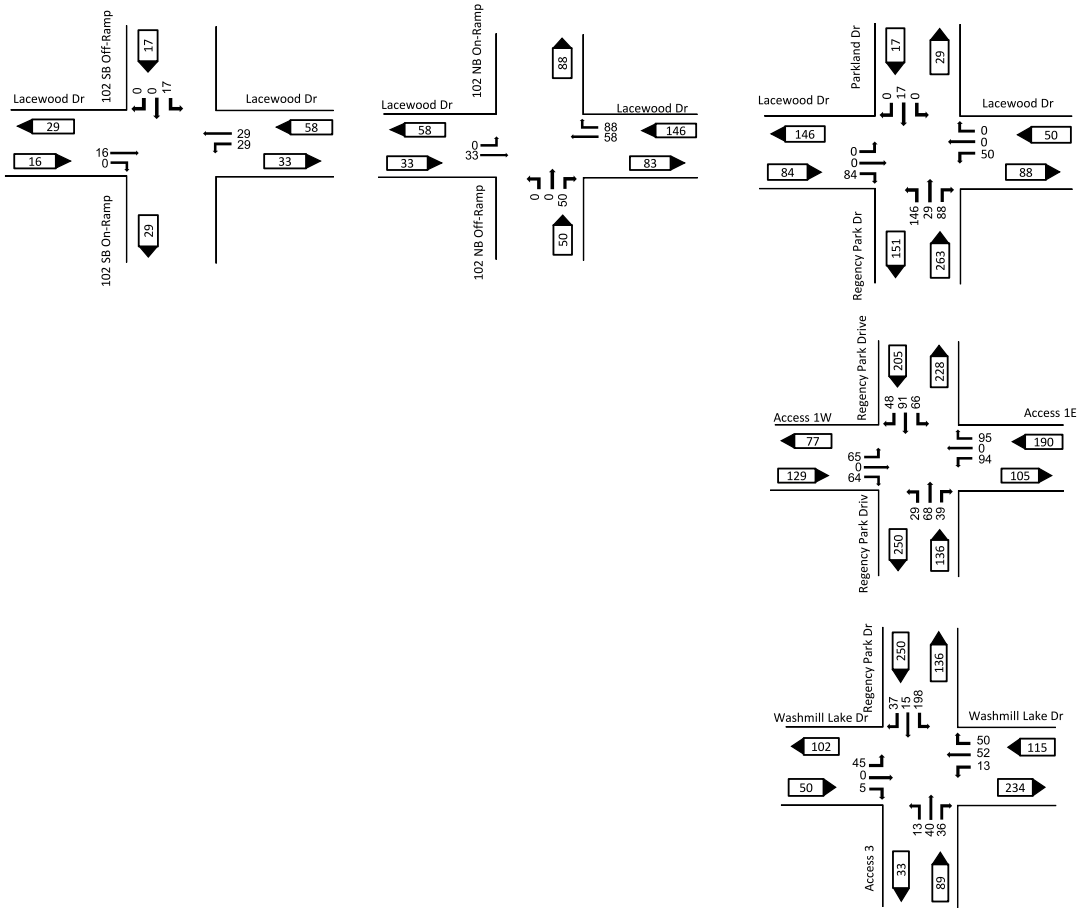
wsp	Regency Links Halifax, NS	Figure A-3A
	Weekday AM Peak Hour 2039 Future Background Traffic Volumes -Diverted Trips	February 2025

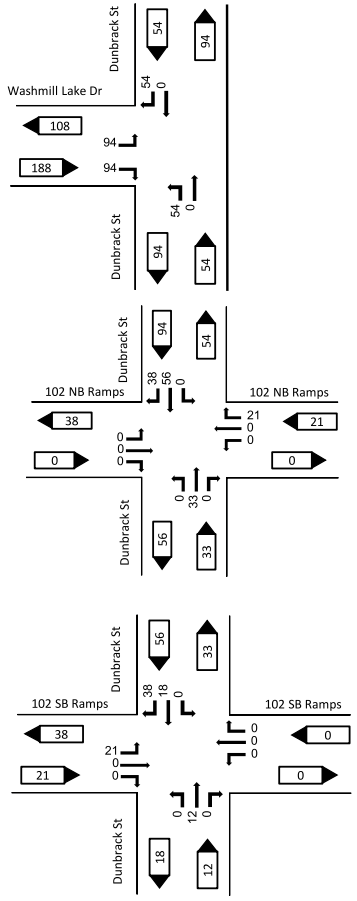
Weekday PM Peak Hour
2039 Future Background Traffic
Volumes - Diverted Trips



wsp	Regency Links Halifax, NS	Figure A-3B
	Weekday PM Peak Hour 2039 Future Background Traffic Volumes - Diverted Trips	February 2025

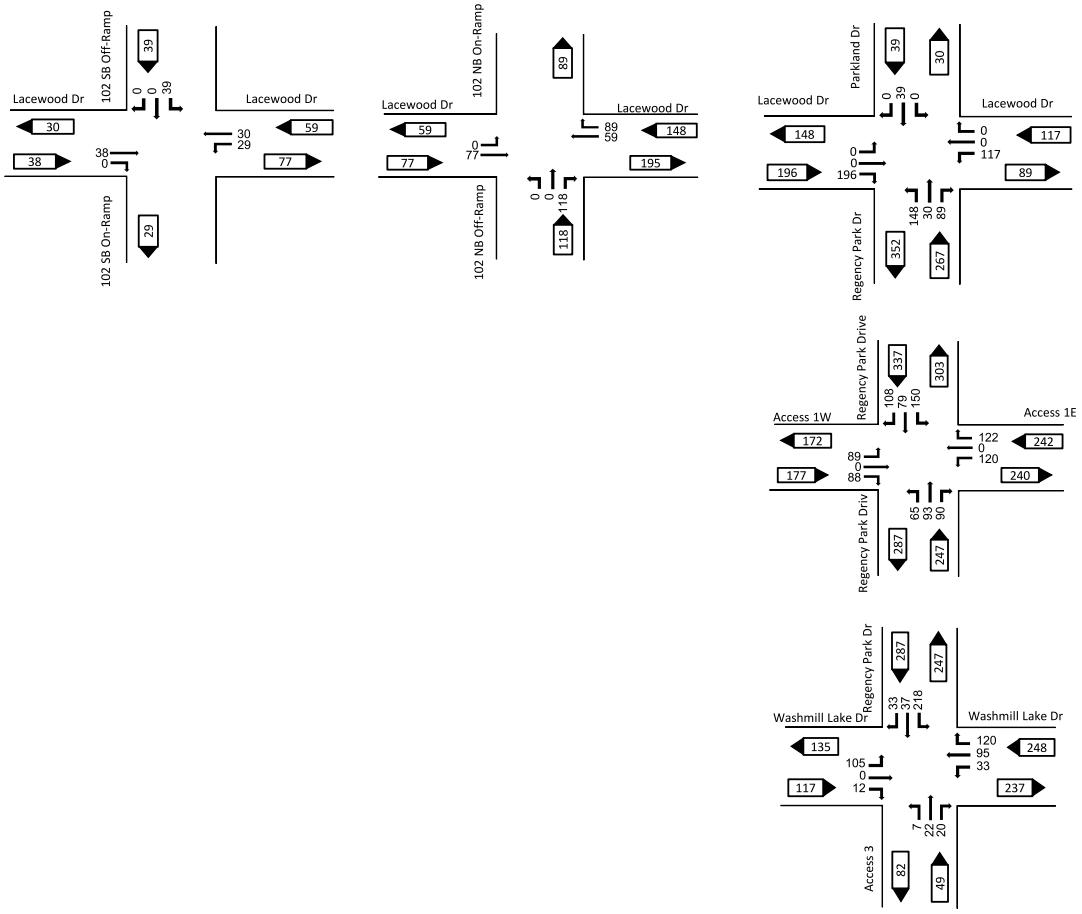
Weekday AM Peak Hour
Trip Assignment

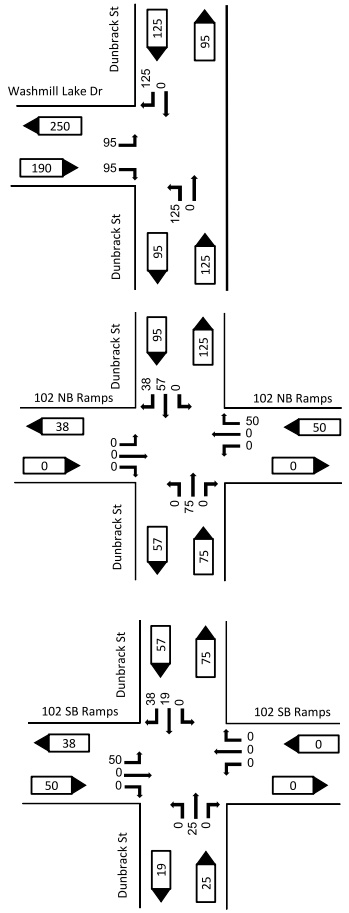




wsp	Regency Links Halifax, NS	Figure A-4A
	Weekday AM Peak Hour Trip Assignment	February 2025

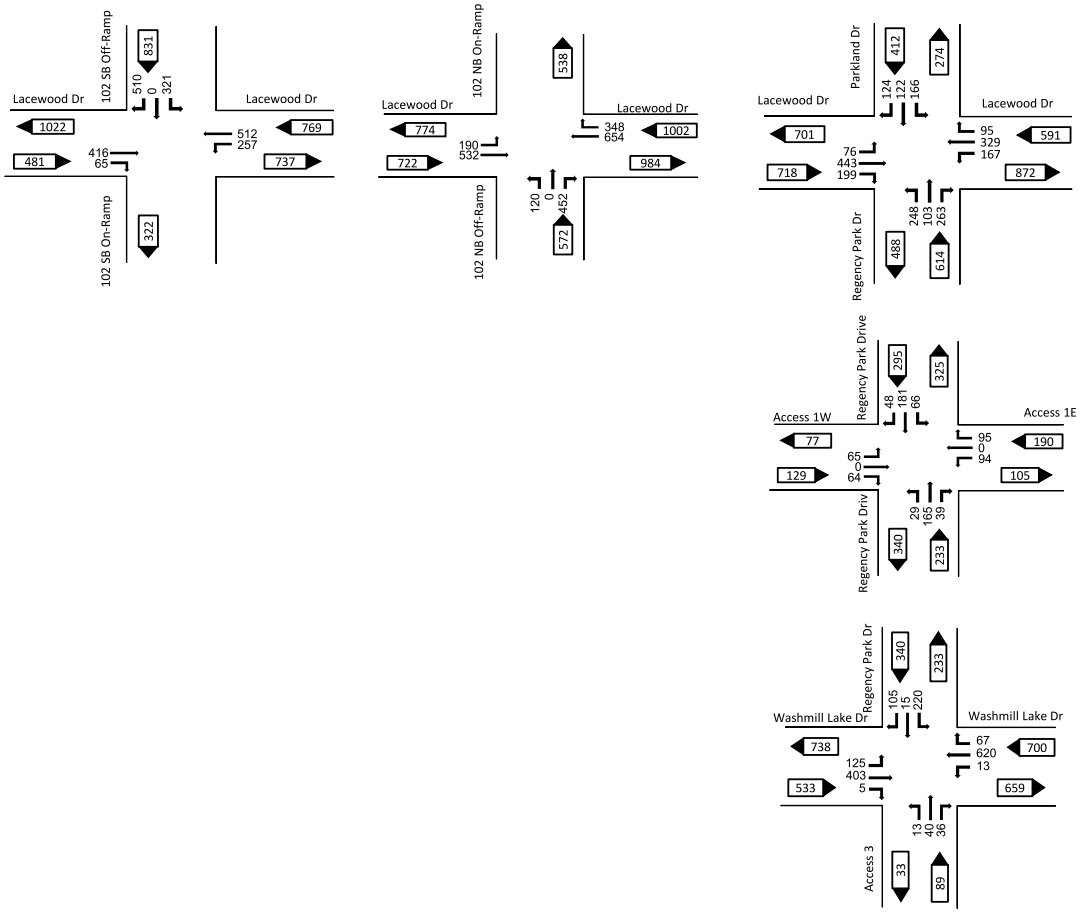
Weekday PM Peak Hour
Trip Assignment



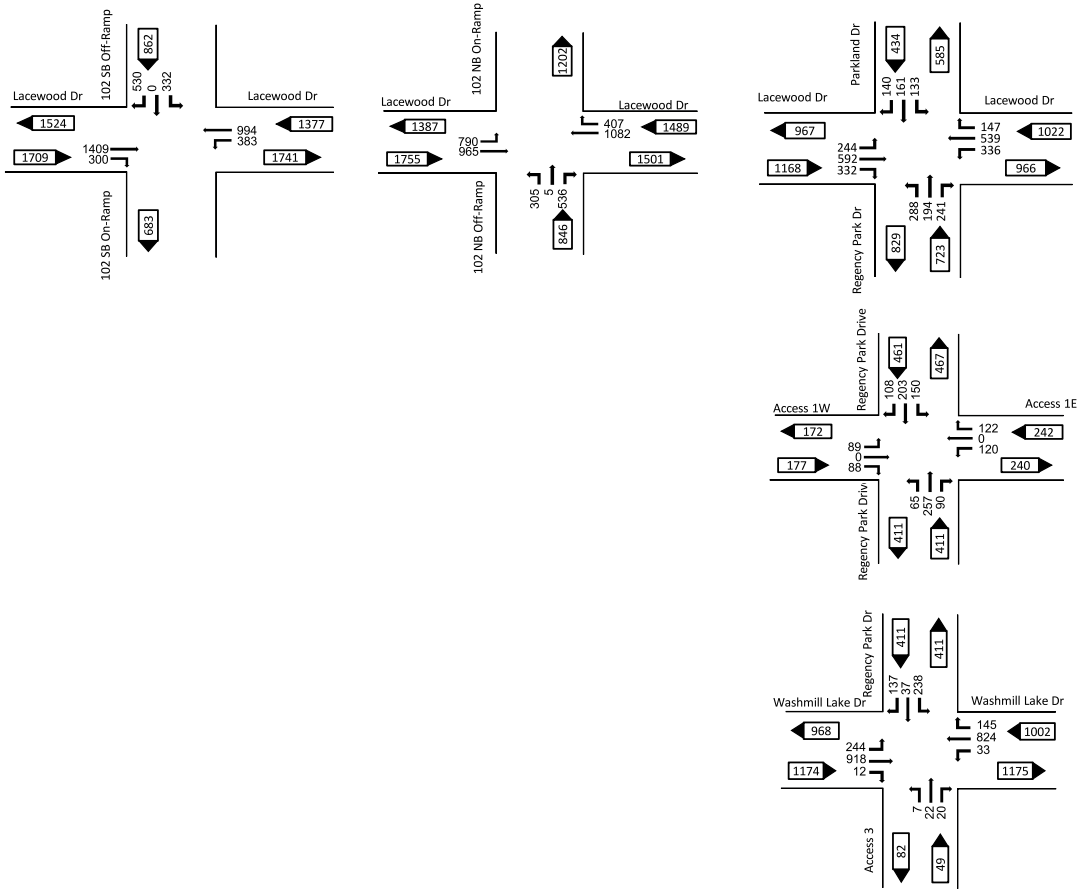


wsp	Regency Links Halifax, NS	Figure A-4B
	Weekday PM Peak Hour Trip Assignment	February 2025

Weekday AM Peak Hour
2039 Total Traffic with Site Generated Trips



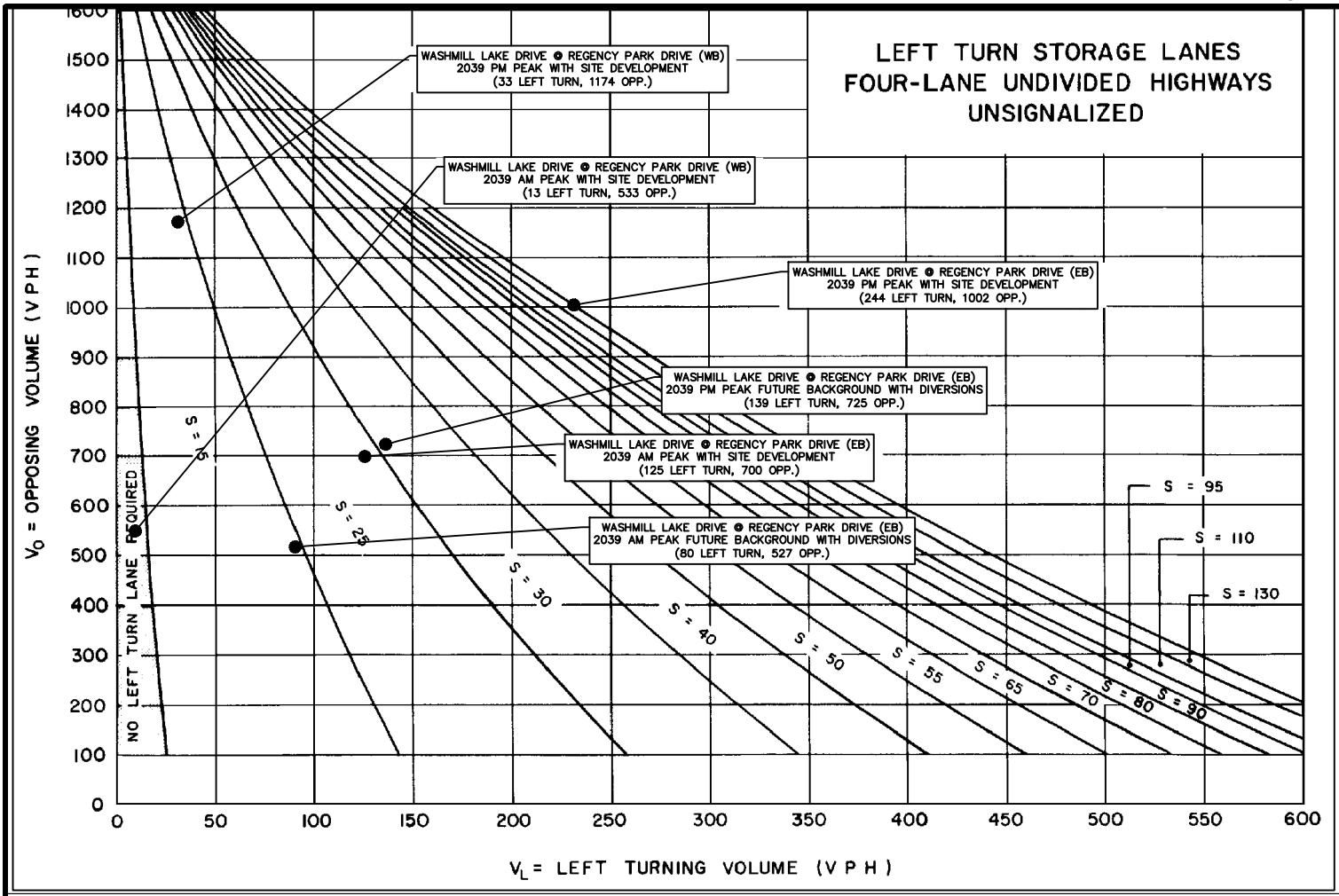
Weekday PM Peak Hour
2039 Total Traffic with Site Generated Trips

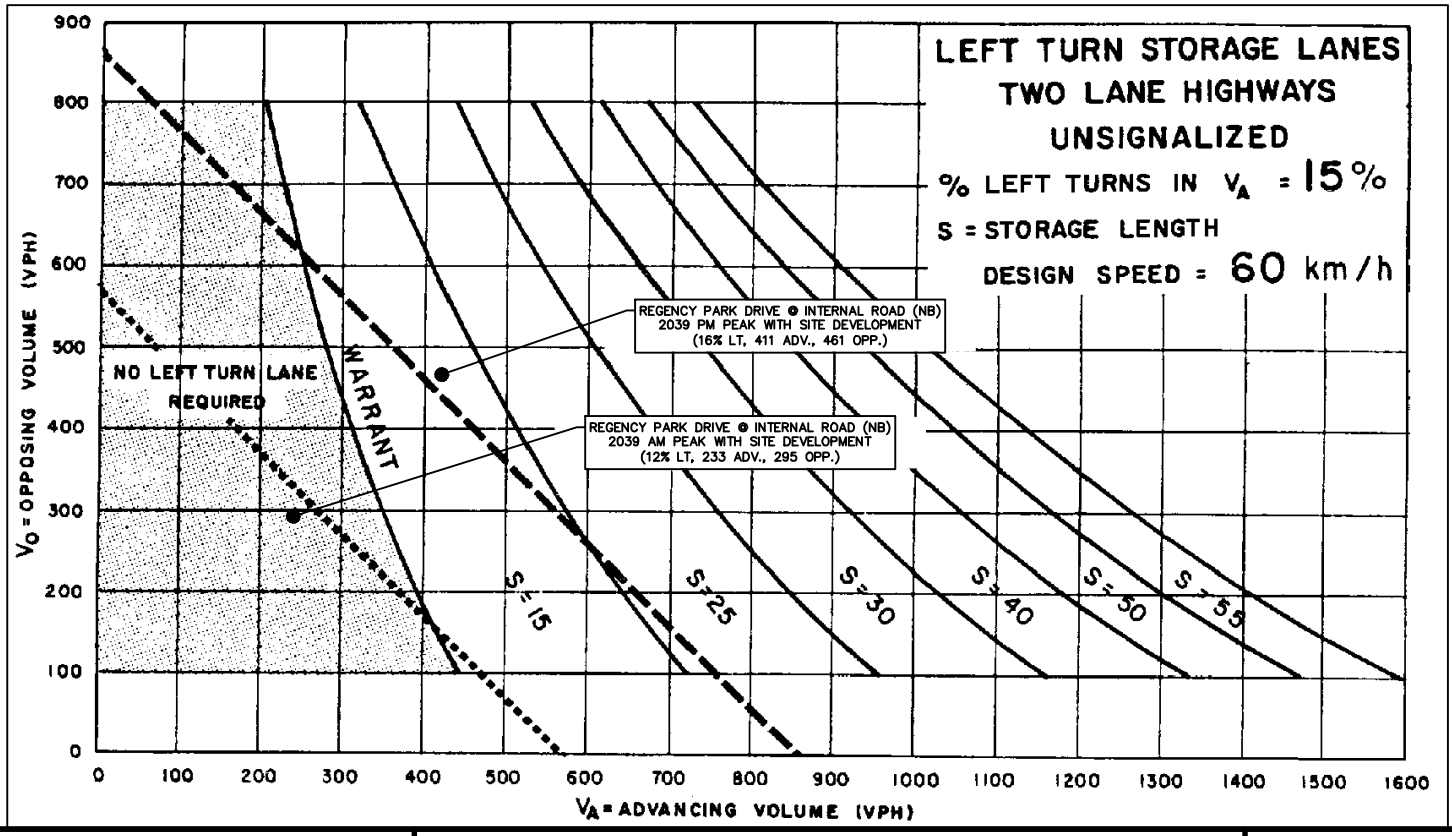


wsp	Regency Links Halifax, NS	Figure A-5B
	Weekday PM Peak Hour 2039 Total Traffic with Site Generated Trips	February 2025

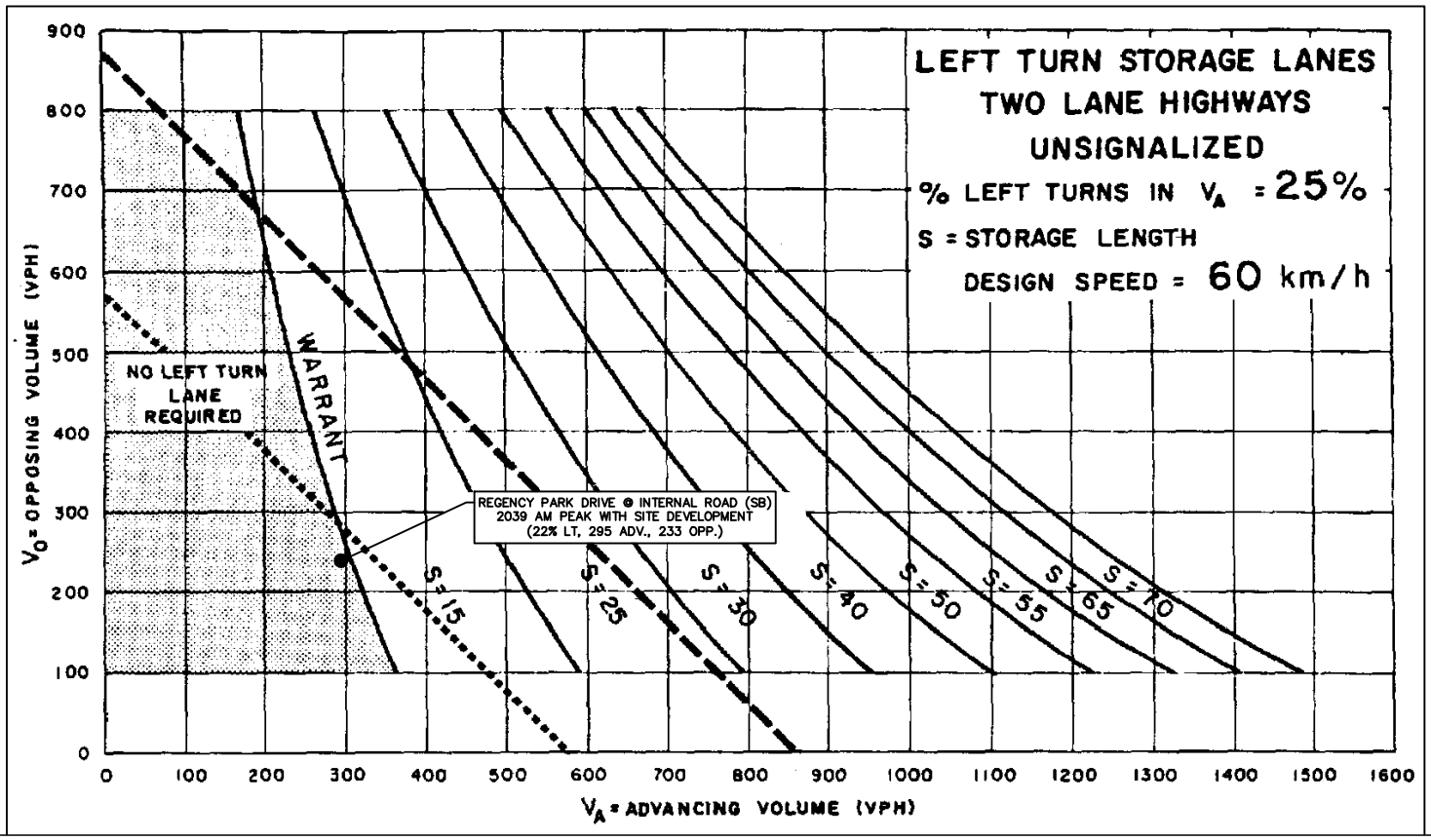
APPENDIX

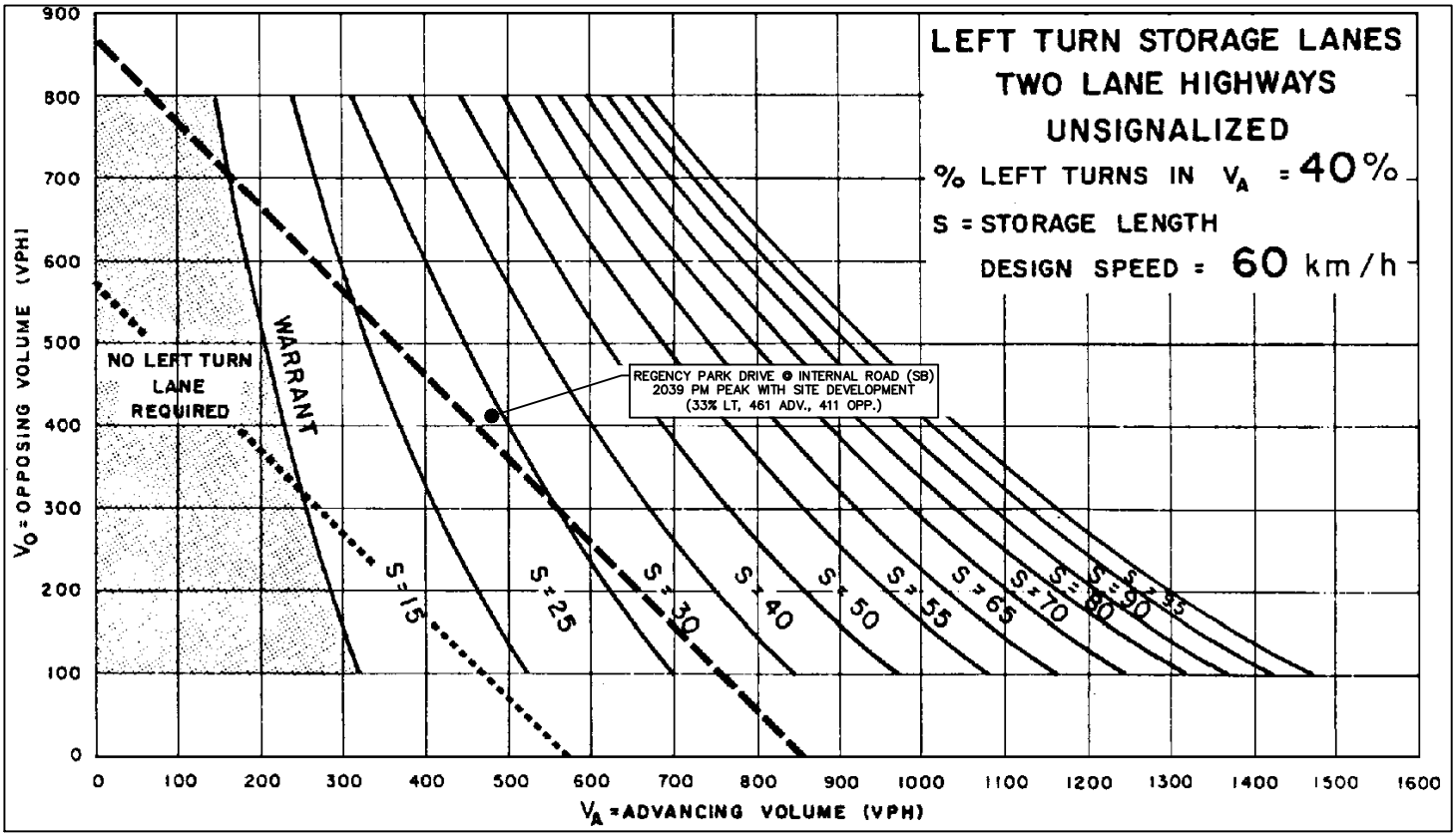
B WARRANT ANALYSIS





wsp	Regency Links - Traffic Impact Study Halifax, NS	Figure B-1
	Left Turn Lane Warrants Washmill Lake Drive at Regency Park Drive & 15% Left Turns	February 2025





wsp	Regency Links - Traffic Impact Study Halifax, NS	Figure B-2
	Left Turn Lane Warrants 25% and 40% Left Turns	February 2025

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table: B-1 - Washmill Lake Drive @ Regency Park Drive
2039 Future with Site Generated Trips

Main Street (name)	Washmill Lake Drive	Direction (EW or NS)	EW	Date:	February 2025
Side Street (name)	Regency Park Drive	Direction (EW or NS)	NS	City:	Halifax, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Washmill Lake Drive	WB		1		1				
Washmill Lake Drive	EB		1		1				
Site Access #3	NB			1					
Regency Park Drive	SB			1					

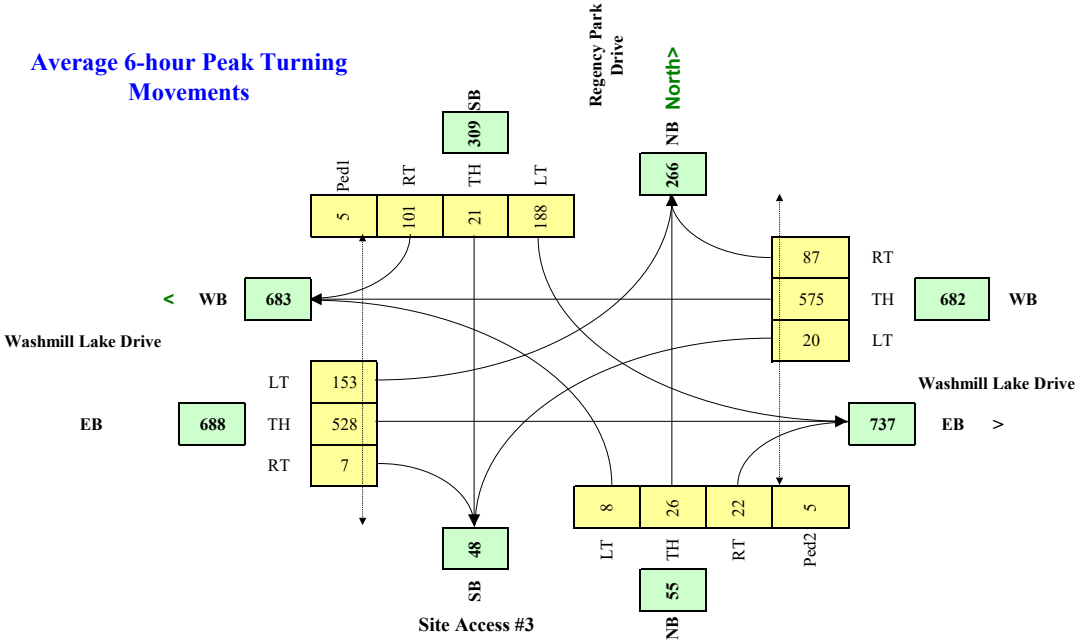
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Washmill Lake Drive	EW	50	2.0%	y	0.0
Regency Park Drive	NS	50	2.0%	y	

	Ped1 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped4 EW S side
7:00 - 8:00	5	5	5	5
8:00 - 9:00	5	5	5	5
11:30 - 12:30	5	5	5	5
12:30 - 13:30	5	5	5	5
16:00 - 17:00	5	5	5	5
17:00 - 18:00	5	5	5	5
Total (6-hour peak)	**30**	**30**	**30**	**30**
Average (6-hour peak)	**5**	**5**	**5**	**5**

Demographics		
Elementary School	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	500,000
Central Business District	(y/n)	y

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	10	35	30	185	15	90	10	480	55	105	320	5
8:00 - 9:00	15	40	35	220	15	105	15	560	65	125	375	5
11:30 - 12:30	5	20	15	140	15	80	15	470	65	120	435	5
12:30 - 13:30	5	20	15	140	15	80	15	470	65	120	435	5
16:00 - 17:00	5	20	20	240	35	135	35	795	145	245	865	10
17:00 - 18:00	5	20	15	200	30	115	30	675	125	205	735	10
Total (6-hour peak)	**45**	**155**	**130**	**1,125**	**125**	**605**	**120**	**3,450**	**520**	**920**	**3,165**	**40**
Average (6-hour peak)	**8**	**26**	**22**	**188**	**21**	**101**	**20**	**575**	**87**	**153**	**528**	**7**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	277	259	18
		Veh	*Ped*

Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table: B-2 - Washmill Lake Drive @ Regency Park Drive
2039 Future Background with Trips Diverted

Main Street (name)	Washmill Lake Drive	Direction (EW or NS)	EW	Date:	February 2025
Side Street (name)	Regency Park Drive	Direction (EW or NS)	NS	City:	Halifax, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Washmill Lake Drive	WB			1	1				
Washmill Lake Drive	EB		1	1					
	NB								
Regency Park Drive	SB			1					

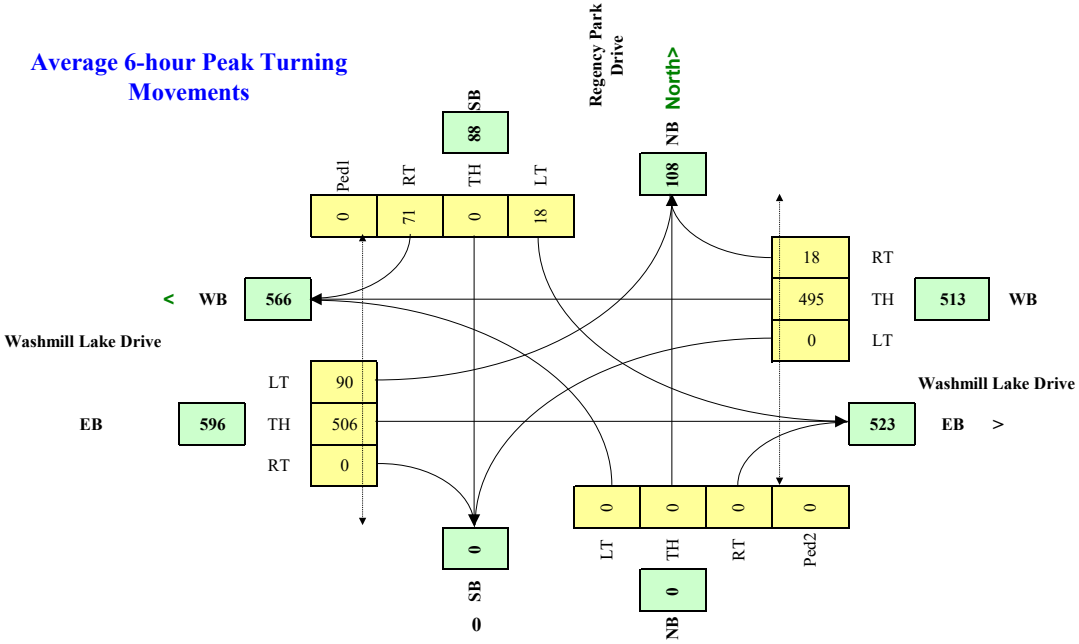
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Washmill Lake Drive	EW	50	2.0%	y	0.0
Regency Park Drive	NS	50	2.0%	y	

	Ped1 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped4 EW S side
7:00 - 8:00				
8:00 - 9:00				
11:30 - 12:30				
12:30 - 13:30				
15:30 - 16:30				
16:30 - 17:30				
Total (6-hour peak)	**0**	**0**	**0**	**0**
Average (6-hour peak)	**0**	**0**	**0**	**0**

Demographics		
Elementary School	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	500,000
Central Business District	(y/n)	y

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	0	0	0	20	0	60	0	435	15	70	320	0
8:00 - 9:00	0	0	0	20	0	70	0	510	15	80	375	0
11:30 - 12:30	0	0	0	15	0	50	0	365	15	65	370	0
12:30 - 13:30	0	0	0	15	0	50	0	365	15	65	370	0
15:30 - 16:30	0	0	0	20	0	105	0	700	25	140	865	0
16:30 - 17:30	0	0	0	15	0	90	0	595	20	120	735	0
Total (6-hour peak)	**0**	**0**	**0**	**105**	**0**	**425**	**0**	**2,970**	**105**	**540**	**3,035**	**0**
Average (6-hour peak)	**0**	**0**	**0**	**18**	**0**	**71**	**0**	**495**	**18**	**90**	**506**	**0**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	45	45 Veh	0 Ped
NOT Warranted			

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table: B-3 - Regency Park Drive @ Internal Intersection (EW)

2039 Future with Site Generated Trips

Main Street (name)	Regency Park Drive	Direction (EW or NS)	NS	Date:	February 2025
Side Street (name)	Internal Road	Direction (EW or NS)	EW	City:	Halifax, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Regency Park Drive	NB	1			1				
Regency Park Drive	SB	1			1				
Internal Road	WB			1					
Internal Road	EB			1					

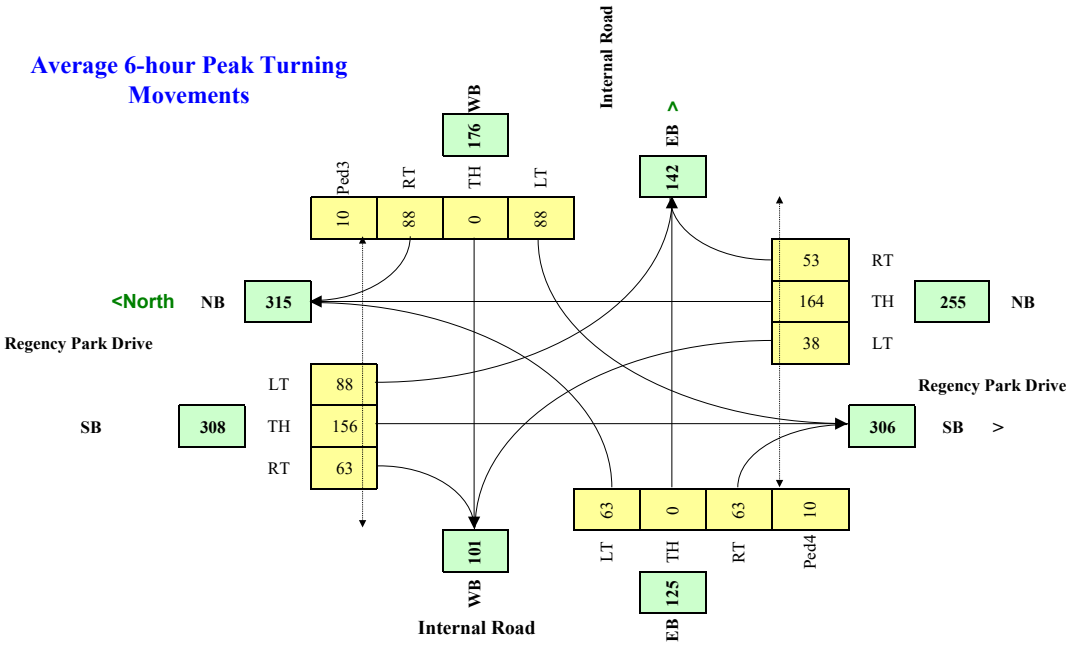
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Regency Park Drive	NS	50	2.0%	y	0.0
Internal Road	EW	50	2.0%	y	

	Ped1	Ped2	Ped3	Ped4
	NS	NS	EW	EW
	W Side	E Side	N Side	S side
7:00 - 8:00	10	10	10	10
8:00 - 9:00	10	10	10	10
11:30 - 12:30	10	10	10	10
12:30 - 13:30	10	10	10	10
15:30 - 16:30	10	10	10	10
16:30 - 17:30	10	10	10	10
Total (6-hour peak)	**60**	**60**	**60**	**60**
Average (6-hour peak)	**10**	**10**	**10**	**10**

Demographics		
Elementary School	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	y
Metro Area Population	(#)	500,000
Central Business District	(y/n)	y

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	25	130	35	55	150	40	80	0	80	55	0	55
8:00 - 9:00	30	150	40	65	175	50	95	0	95	65	0	65
11:30 - 12:30	25	120	40	65	115	45	65	0	65	45	0	45
12:30 - 13:30	25	120	40	65	115	45	65	0	65	45	0	45
15:30 - 16:30	65	250	90	150	205	110	120	0	120	90	0	90
16:30 - 17:30	55	215	75	130	175	90	100	0	105	75	0	75
Total (6-hour peak)	**225**	**985**	**320**	**530**	**935**	**380**	**525**	**0**	**530**	**375**	**0**	**375**
Average (6-hour peak)	**38**	**164**	**53**	**88**	**156**	**63**	**88**	**0**	**88**	**63**	**0**	**63**

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	79	64	15
		Veh	*Ped*

NOT Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table: B-4 - Dunbrack Street @ 102 NB Ramps
2039 Future with Background Development

Main Street (name)	Dunbrack Street	Direction (EW or NS)	NS	Date:	February 2025
Side Street (name)	Highway 102 NB	Direction (EW or NS)	EW	City:	Halifax, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Dunbrack Street	NB			2		1		2	
Dunbrack Street	SB			2		1		2	
Highway 102 NB	WB	1				1			
Highway 102 NB	EB								

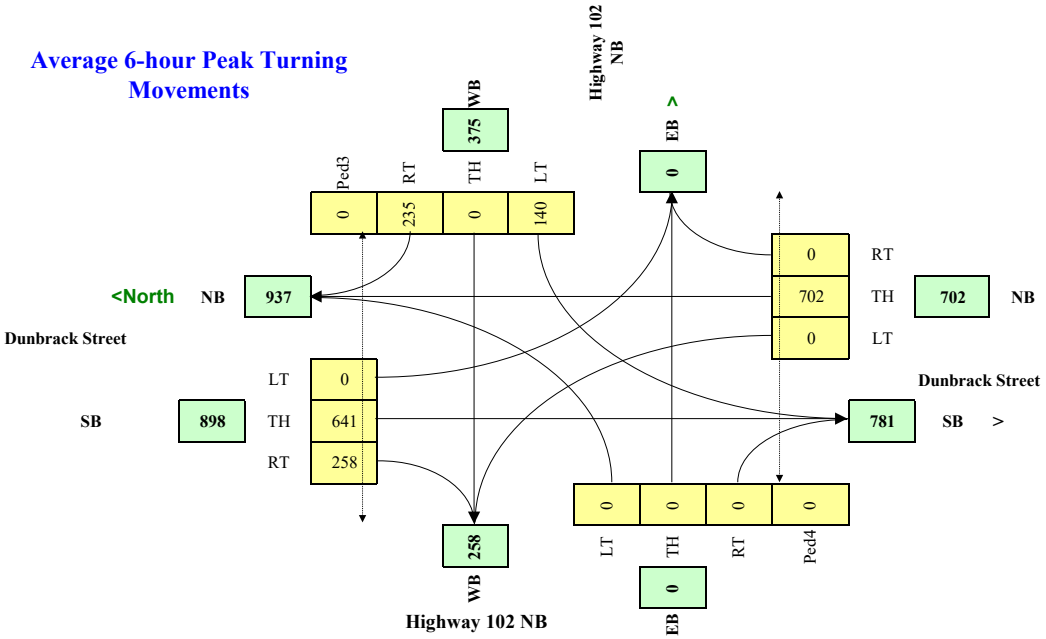
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Dunbrack Street	NS	60	2.0%	y	6.0
Highway 102 NB	EW	60	2.0%	n	

	Ped1 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped4 EW S side
7:00 - 8:00				
8:00 - 9:00				
11:30 - 12:30				
12:30 - 13:30				
15:30 - 16:30				
16:30 - 17:30				
Total (6-hour peak)	0	0	0	0
Average (6-hour peak)	0	0	0	0

Demographics		
Elementary School	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	400,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	0	925	0	0	635	280	110	0	175	0	0	0
8:00 - 9:00	0	785	0	0	540	240	95	0	150	0	0	0
11:30 - 12:30	0	450	0	0	410	165	90	0	150	0	0	0
12:30 - 13:30	0	450	0	0	410	165	90	0	150	0	0	0
15:30 - 16:30	0	735	0	0	850	320	210	0	360	0	0	0
16:30 - 17:30	0	865	0	0	1000	375	245	0	425	0	0	0
Total (6-hour peak)	0	4,210	0	0	3,845	1,545	840	0	1,410	0	0	0
Average (6-hour peak)	0	702	0	0	641	258	140	0	235	0	0	0

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	142	142	0
		Veh	*Ped*

Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table: B-5 - Dunbrack Street @ 102 NB Ramps
2039 Future with Site Trips

Main Street (name)	Dunbrack Street	Direction (EW or NS)	NS	Date:	January 2025
Side Street (name)	Highway 102 NB	Direction (EW or NS)	EW	City:	Halifax, NS

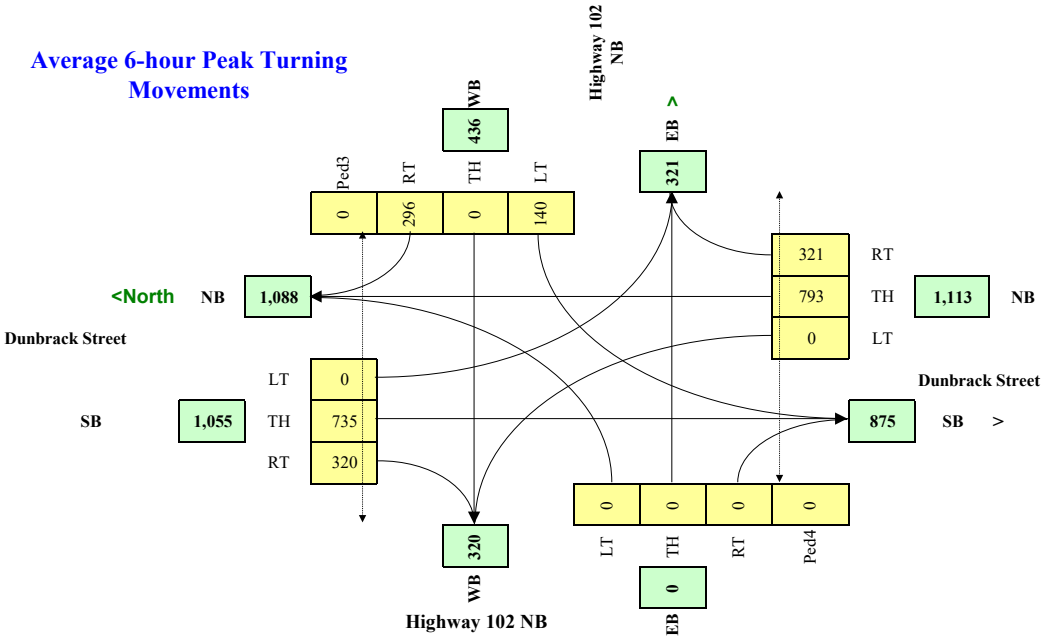
Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Dunbrack Street	NB			2		1		2	
Dunbrack Street	SB			2		1		2	
Highway 102 NB	WB	1				1			
Highway 102 NB	EB								

Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Dunbrack Street	NS	60	2.0%	y	6.0
Highway 102 NB	EW	60	2.0%	n	

	Ped1 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped4 EW S side
7:00 - 8:00				
8:00 - 9:00				
11:30 - 12:30				
12:30 - 13:30				
15:30 - 16:30				
16:30 - 17:30				
Total (6-hour peak)	0	0	0	0
Average (6-hour peak)	0	0	0	0

Demographics		
Elementary School	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	400,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	0	1005	400	0	755	360	110	0	225	0	0	0
8:00 - 9:00	0	850	340	0	635	300	95	0	190	0	0	0
11:30 - 12:30	0	505	205	0	470	205	90	0	190	0	0	0
12:30 - 13:30	0	505	205	0	470	205	90	0	190	0	0	0
15:30 - 16:30	0	870	355	0	955	390	210	0	450	0	0	0
16:30 - 17:30	0	1020	420	0	1125	460	245	0	530	0	0	0
Total (6-hour peak)	0	4,755	1,925	0	4,410	1,920	840	0	1,775	0	0	0
Average (6-hour peak)	0	793	321	0	735	320	140	0	296	0	0	0



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	186	186	0
		Veh	*Ped*

Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table: B-6 - Dunbrack Street @ 102 SB Ramps
2039 Future with Background Development

Main Street (name)	Dunbrack Street	Direction (EW or NS)	NS	Date:	February 2025
Side Street (name)	Highway 102 SB	Direction (EW or NS)	EW	City:	Halifax, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Dunbrack Street	NB			2		1		2	
Dunbrack Street	SB			2		1		2	
Highway 102 SB	WB								
Highway 102 SB	EB	1				1			

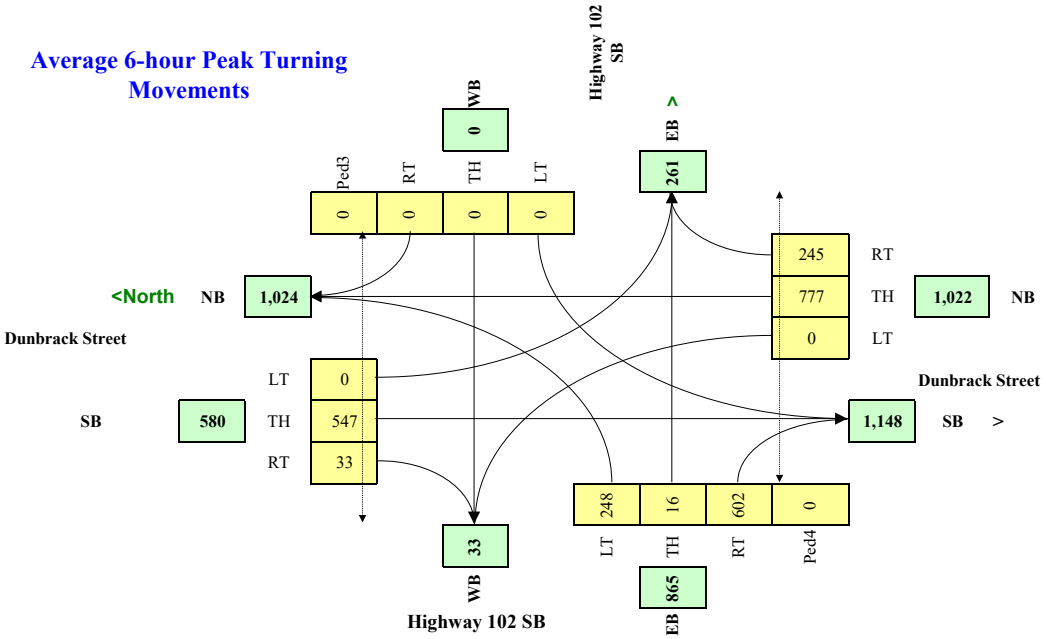
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Dunbrack Street	NS	60	2.0%	y	6.0
Highway 102 SB	EW	60	2.0%	n	

	Ped1 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped4 EW S side
7:00 - 8:00				
8:00 - 9:00				
11:30 - 12:30				
12:30 - 13:30				
15:30 - 16:30				
16:30 - 17:30				
Total (6-hour peak)	0	0	0	0
Average (6-hour peak)	0	0	0	0

Demographics		
Elementary School	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	400,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	0	955	515	0	365	45	0	0	0	370	40	800
8:00 - 9:00	0	810	440	0	310	40	0	0	0	315	35	680
11:30 - 12:30	0	495	155	0	350	20	0	0	0	160	10	385
12:30 - 13:30	0	495	155	0	350	20	0	0	0	160	10	385
15:30 - 16:30	0	875	95	0	875	35	0	0	0	220	0	625
16:30 - 17:30	0	1030	110	0	1030	40	0	0	0	260	0	735
Total (6-hour peak)	0	4,660	1,470	0	3,280	200	0	0	0	1,485	95	3,610
Average (6-hour peak)	0	777	245	0	547	33	0	0	0	248	16	602

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	316	316	0
		Veh	*Ped*

Warranted

2005 Canadian Traffic Signal Warrant Matrix Analysis

Table: B-7 - Dunbrack Street @ 102 SB Ramps
2039 Future with Background Development

Main Street (name)	Dunbrack Street	Direction (EW or NS)	NS	Date:	February 2025
Side Street (name)	Highway 102 SB	Direction (EW or NS)	EW	City:	Halifax, NS

Lane Configuration		Excl LT	Th & LT	Through or Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes	
Dunbrack Street	NB			2		1		2	
Dunbrack Street	SB			2		1		2	
Highway 102 SB	WB								
Highway 102 SB	EB	1				1			

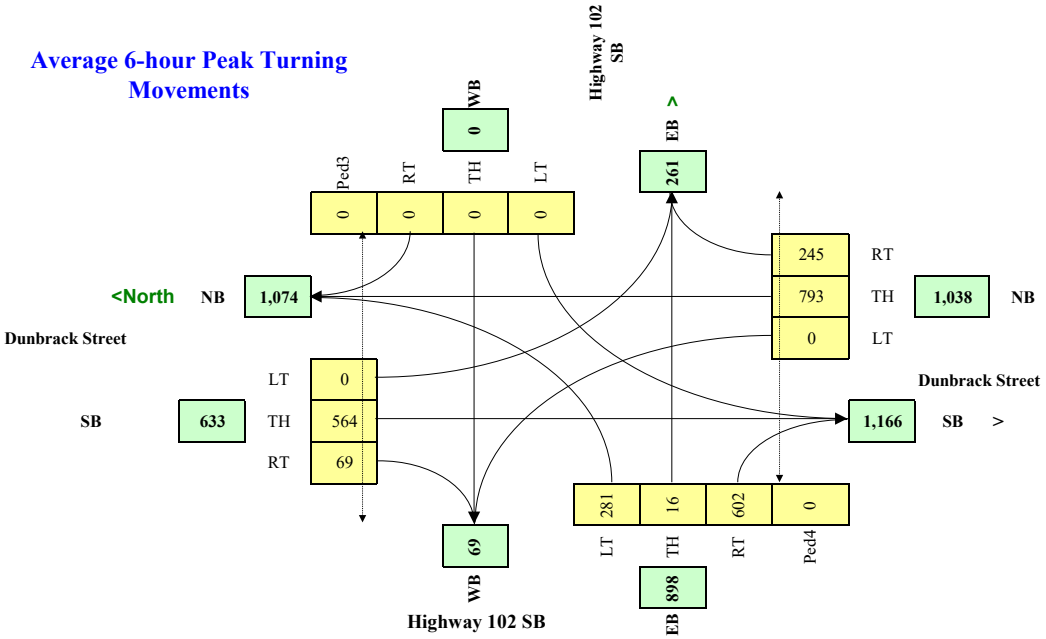
Other input		Speed (Km/h)	Trucks %	Bus Rt (y/n)	Median (m)
Dunbrack Street	NS	60	2.0%	y	6.0
Highway 102 SB	EW	60	2.0%	n	

	Ped1 NS W Side	Ped2 NS E Side	Ped3 EW N Side	Ped4 EW S side
7:00 - 8:00				
8:00 - 9:00				
11:30 - 12:30				
12:30 - 13:30				
15:30 - 16:30				
16:30 - 17:30				
Total (6-hour peak)	0	0	0	0
Average (6-hour peak)	0	0	0	0

Demographics		
Elementary School	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	400,000
Central Business District	(y/n)	n

Traffic Input	NB			SB			WB			EB		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
7:00 - 8:00	0	970	515	0	385	90	0	0	0	400	40	800
8:00 - 9:00	0	825	440	0	330	75	0	0	0	340	35	680
11:30 - 12:30	0	505	155	0	360	45	0	0	0	180	10	385
12:30 - 13:30	0	505	155	0	360	45	0	0	0	180	10	385
15:30 - 16:30	0	900	95	0	895	75	0	0	0	270	0	625
16:30 - 17:30	0	1055	110	0	1055	85	0	0	0	315	0	735
Total (6-hour peak)	0	4,760	1,470	0	3,385	415	0	0	0	1,685	95	3,610
Average (6-hour peak)	0	793	245	0	564	69	0	0	0	281	16	602

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$

W =	350	350	0
		Veh	*Ped*

Warranted

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Regency Links	**Organization:**	WSP
Project Location:	Regency Park Drive	**Performed By:**	Brianna Rietzel
Scenario Description:	AM Peak Hour	**Date:**	2025-02-20
Analysis Year:	2039	**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				368	221	147
Restaurant				0		
Cinema/Entertainment				0		
Residential				917	238	679
Hotel				0		
All Other Land Uses[2]				0		
				1,285	459	826

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	5	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	7	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,439	528	911
Internal Capture Percentage	2%	2%	1%
External Vehicle-Trips[5]	1,264	449	815
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	3%	3%
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:	Regency Links	**Organization:**	WSP
Project Location:	Regency Park Drive	**Performed By:**	Brianna Rietzel
Scenario Description:	PM Peak Hour	**Date:**	2025-02-20
Analysis Year:	2039	**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				1,026	513	513
Restaurant				0		
Cinema/Entertainment				0		
Residential				1,088	675	413
Hotel				0		
All Other Land Uses[2]				0		
				2,114	1,188	926

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	146	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	47	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	2,502	1,397	1,105
Internal Capture Percentage	15%	14%	17%
External Vehicle-Trips[5]	1,785	1,022	763
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	8%	24%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	19%	9%
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 made
[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

C

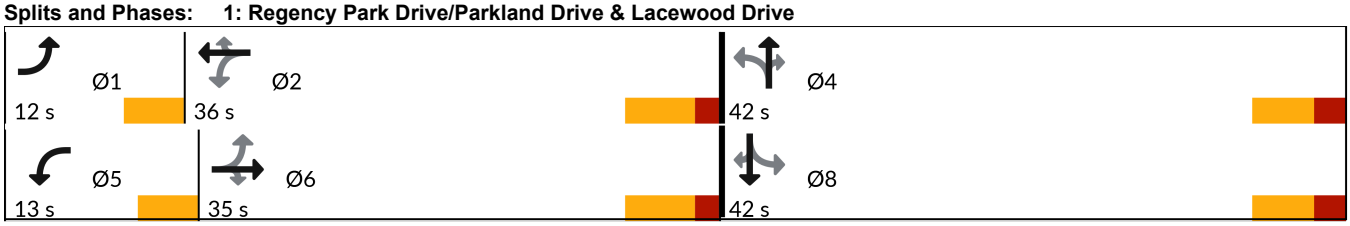
INTERSECTION PERFORMANCE ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	470	135	90	320	100	120	50	135	175	65	155
Future Volume (vph)	95	470	135	90	320	100	120	50	135	175	65	155
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.543			0.454			0.711			0.722		
Satd. Flow (perm)	983	3539	1504	835	3539	1482	1302	1863	1547	1331	1863	1536
Satd. Flow (RTOR)			88			88			147			168
Lane Group Flow (vph)	103	511	147	98	348	109	130	54	147	190	71	168
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2		2	4		4	8		8
Total Split (s)	12.0	35.0	35.0	13.0	36.0	36.0	42.0	42.0	42.0	42.0	42.0	42.0
Total Lost Time (s)	4.0	6.3	6.3	4.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Act Effct Green (s)	22.5	14.5	14.5	23.1	14.8	14.8	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.45	0.29	0.29	0.46	0.30	0.30	0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	0.18	0.50	0.29	0.18	0.33	0.22	0.38	0.11	0.29	0.54	0.14	0.32
Control Delay (s/veh)	8.0	18.5	10.1	7.9	16.5	7.4	19.9	15.7	5.2	23.4	16.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	8.0	18.5	10.1	7.9	16.5	7.4	19.9	15.7	5.2	23.4	16.0	5.1
LOS	A	B	B	A	B	A	B	B	A	C	B	A
Approach Delay (s/veh)		15.4			13.2			12.7			15.0	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	4.1	21.3	4.2	3.9	13.6	1.4	9.8	3.8	0.0	15.0	5.0	0.0
Queue Length 95th (m)	13.4	42.8	18.6	12.9	28.7	12.2	25.4	11.9	11.0	36.3	14.6	11.7
Internal Link Dist (m)		122.8			242.6			314.2			320.2	
Turn Bay Length (m)	55.0		7.0	50.0		7.0	35.0		7.0	35.0		7.0
Base Capacity (vph)	586	2163	953	581	2238	970	957	1369	1176	978	1369	1173
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.24	0.15	0.17	0.16	0.11	0.14	0.04	0.13	0.19	0.05	0.14

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 49.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay (s/veh): 14.3
Intersection LOS: B
Intersection Capacity Utilization 51.1%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Regency Park Drive/Parkland Drive & Lacewood Drive

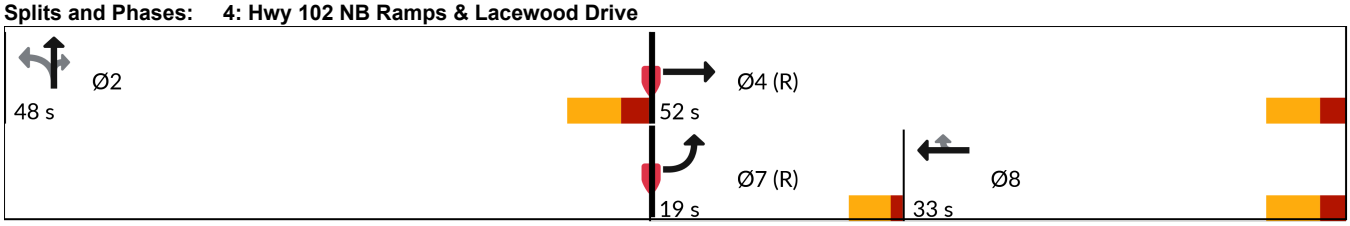


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	545	0	0	580	235	120	0	390	0	0	0
Future Volume (vph)	190	545	0	0	580	235	120	0	390	0	0	0
Satd. Flow (prot)	3433	3539	0	0	5085	1583	1681	1681	1583	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	3433	3539	0	0	5085	1583	1681	1681	1583	0	0	0
Satd. Flow (RTOR)						255			193			
Lane Group Flow (vph)	207	592	0	0	630	255	65	65	424	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Total Split (s)	19.0	52.0			33.0	33.0	48.0	48.0	48.0			
Total Lost Time (s)	4.0	6.0			6.0	6.0	6.0	6.0	6.0			
Act Effct Green (s)	42.7	65.5			18.8	18.8	22.5	22.5	22.5			
Actuated g/C Ratio	0.43	0.66			0.19	0.19	0.23	0.23	0.23			
v/c Ratio	0.14	0.26			0.66	0.51	0.17	0.17	0.84			
Control Delay (s/veh)	2.2	1.8			40.7	7.9	28.7	28.7	33.9			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay (s/veh)	2.2	1.8			40.7	7.9	28.7	28.7	33.9			
LOS	A	A			D	A	C	C	C			
Approach Delay (s/veh)		1.9			31.3			32.7				
Approach LOS		A			C			C				
Queue Length 50th (m)	0.1	2.2			44.2	0.0	11.3	11.3	46.7			
Queue Length 95th (m)	8.0	25.7			53.4	19.7	19.7	19.7	72.2			
Internal Link Dist (m)		118.1			149.0			197.6			197.9	
Turn Bay Length (m)						60.0			60.0			
Base Capacity (vph)	1465	2318			1372	613	706	706	776			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.14	0.26			0.46	0.42	0.09	0.09	0.55			

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 7 (7%), Referenced to phase 4:EBT and 7:EBL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay (s/veh): 21.1
Intersection LOS: C
Intersection Capacity Utilization 49.2%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Hwy 102 NB Ramps & Lacewood Drive

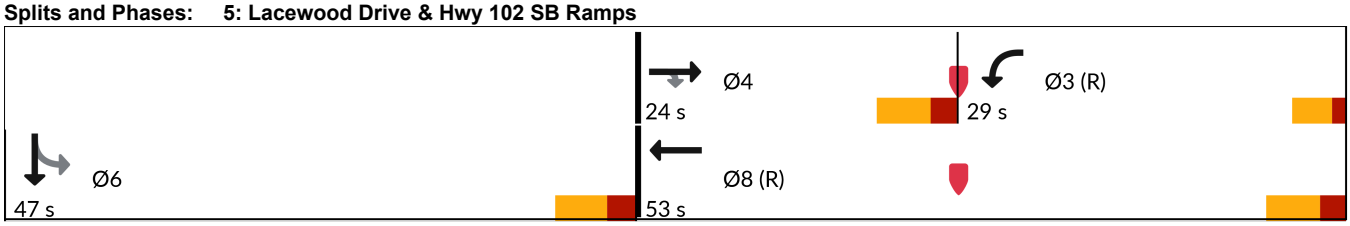


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	440	65	220	475	0	0	0	0	300	0	510
Future Volume (vph)	0	440	65	220	475	0	0	0	0	300	0	510
Satd. Flow (prot)	0	6408	1583	1770	3539	0	0	0	0	1681	1681	1583
Flt Permitted				0.950						0.950	0.950	
Satd. Flow (perm)	0	6408	1530	1757	3539	0	0	0	0	1681	1681	1583
Satd. Flow (RTOR)			98									554
Lane Group Flow (vph)	0	478	71	239	516	0	0	0	0	163	163	554
Turn Type		NA	Perm	Prot	NA					Perm	NA	Free
Protected Phases		4		3	8						6	
Permitted Phases			4							6		Free
Total Split (s)		24.0	24.0	29.0	53.0					47.0	47.0	
Total Lost Time (s)		6.0	6.0	4.0	6.0					6.0	6.0	
Act Effct Green (s)		12.9	12.9	55.9	72.8					15.2	15.2	100.0
Actuated g/C Ratio		0.13	0.13	0.56	0.73					0.15	0.15	1.00
v/c Ratio		0.58	0.25	0.24	0.20					0.64	0.64	0.35
Control Delay (s/veh)		43.6	6.0	1.6	1.1					50.6	50.6	0.6
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay (s/veh)		43.6	6.0	1.6	1.1					50.6	50.6	0.6
LOS		D	A	A	A					D	D	A
Approach Delay (s/veh)		38.7			1.2						19.1	
Approach LOS		D			A						B	
Queue Length 50th (m)		27.1	0.0	0.7	1.0					33.3	33.3	0.0
Queue Length 95th (m)		34.8	7.3	3.9	7.1					52.4	52.4	0.0
Internal Link Dist (m)		108.2			118.1			188.6			191.5	
Turn Bay Length (m)			70.0									90.0
Base Capacity (vph)		1153	355	988	2576					689	689	1583
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.41	0.20	0.24	0.20					0.24	0.24	0.35

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 44 (44%), Referenced to phase 3:WBL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay (s/veh): 17.9
Intersection LOS: B
Intersection Capacity Utilization 49.2%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Lacewood Drive & Hwy 102 SB Ramps

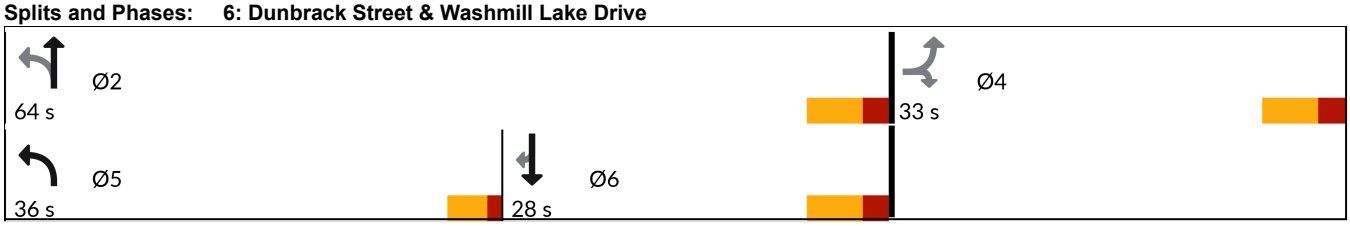


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	35	330	340	755	580	50
Future Volume (vph)	35	330	340	755	580	50
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.239			
Satd. Flow (perm)	1693	1466	444	3539	3539	1541
Satd. Flow (RTOR)		359				15
Lane Group Flow (vph)	38	359	370	821	630	54
Turn Type	Perm	Perm	pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4	4	2			6
Total Split (s)	33.0	33.0	36.0	64.0	28.0	28.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	12.7	12.7	43.2	41.0	16.8	16.8
Actuated g/C Ratio	0.19	0.19	0.64	0.61	0.25	0.25
v/c Ratio	0.12	0.63	0.55	0.38	0.71	0.14
Control Delay (s/veh)	25.1	8.7	10.9	8.1	30.8	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	25.1	8.7	10.9	8.1	30.8	21.0
LOS	C	A	B	A	C	C
Approach Delay (s/veh)	10.3			9.0	30.0	
Approach LOS	B			A	C	
Queue Length 50th (m)	3.8	0.0	11.3	16.0	30.8	3.1
Queue Length 95th (m)	13.5	21.8	54.5	53.5	82.6	16.4
Internal Link Dist (m)	384.9			233.6	199.1	
Turn Bay Length (m)			120.0			7.0
Base Capacity (vph)	758	855	1000	2998	1292	572
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.42	0.37	0.27	0.49	0.09

Intersection Summary

Cycle Length: 97
Actuated Cycle Length: 67.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay (s/veh): 15.5
Intersection LOS: B
Intersection Capacity Utilization 68.4%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Dunbrack Street & Washmill Lake Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	110	0	175	0	925	400	0	625	270
Future Volume (Veh/h)	0	0	0	110	0	175	0	925	400	0	625	270
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	120	0	190	0	1005	435	0	679	293
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						6						
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1182	1684	340	1345	1684	503	679			1005		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1182	1684	340	1345	1684	503	679			1005		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	100	63	100			100		
cM capacity (veh/h)	92	93	656	110	93	514	909			685		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	310	503	503	435	340	340	293
Volume Left	120	0	0	0	0	0	0
Volume Right	190	0	0	435	0	0	293
cSH	274	1700	1700	1700	1700	1700	1700
Volume to Capacity	1.13	0.30	0.30	0.26	0.20	0.20	0.17
Queue Length 95th (m)	106.2	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s/veh)	134.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	F						
Approach Delay (s/veh)	134.8	0.0			0.0		
Approach LOS	F						

Intersection Summary				
Average Delay	15.4			
Intersection Capacity Utilization	43.1%	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)	370	40	800	0	0	0	0	955	515	0	365	35
Future Volume (Veh/h)	370	40	800	0	0	0	0	955	515	0	365	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	402	43	870	0	0	0	0	1038	560	0	397	38
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	916	1435	199	1258	1435	519	397			1038		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	916	1435	199	1258	1435	519	397			1038		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	68	0	0	100	100	100			100		
cM capacity (veh/h)	227	133	809	0	133	502	1158			665		

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	445	870	519	519	560	199	199	38
Volume Left	402	0	0	0	0	0	0	0
Volume Right	0	870	0	0	560	0	0	38
cSH	213	809	1700	1700	1700	1700	1700	1700
Volume to Capacity	2.09	1.07	0.31	0.31	0.33	0.12	0.12	0.02
Queue Length 95th (m)	271.7	178.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s/veh)	544.3	75.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	F						
Approach Delay (s/veh)	234.2		0.0			0.0		
Approach LOS	F							

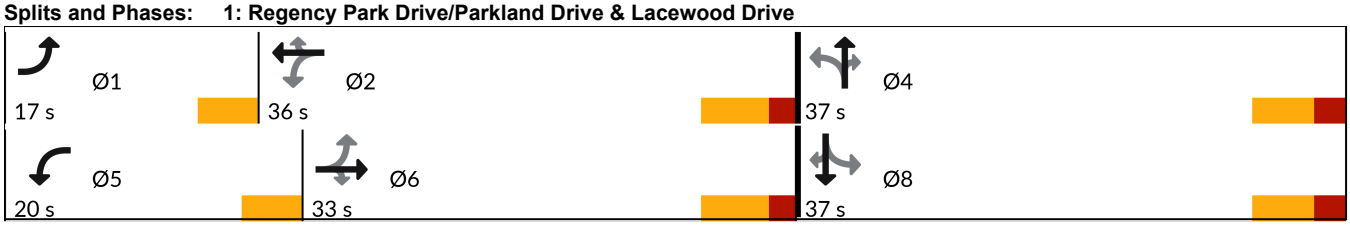
Intersection Summary				
Average Delay	92.0			
Intersection Capacity Utilization	66.3%	ICU Level of Service	C	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	615	160	170	575	155	165	95	95	140	80	175
Future Volume (vph)	305	615	160	170	575	155	165	95	95	140	80	175
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.308			0.360			0.701			0.690		
Satd. Flow (perm)	562	3539	1482	662	3539	1467	1286	1863	1553	1277	1863	1538
Satd. Flow (RTOR)			88			88			103			190
Lane Group Flow (vph)	332	668	174	185	625	168	179	103	103	152	87	190
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2		2	4		4	8		8
Total Split (s)	17.0	33.0	33.0	20.0	36.0	36.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Lost Time (s)	4.0	6.3	6.3	4.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Act Effct Green (s)	32.5	18.9	18.9	29.0	17.2	17.2	14.1	14.1	14.1	14.1	14.1	14.1
Actuated g/C Ratio	0.54	0.32	0.32	0.49	0.29	0.29	0.24	0.24	0.24	0.24	0.24	0.24
v/c Ratio	0.63	0.60	0.33	0.37	0.61	0.35	0.59	0.23	0.23	0.50	0.20	0.37
Control Delay (s/veh)	12.9	20.5	11.2	9.2	22.0	11.9	30.0	21.0	6.4	27.3	20.6	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.9	20.5	11.2	9.2	22.0	11.9	30.0	21.0	6.4	27.3	20.6	6.1
LOS	B	C	B	A	C	B	C	C	A	C	C	A
Approach Delay (s/veh)		17.0			17.9			21.3			16.5	
Approach LOS		B			B			C			B	
Queue Length 50th (m)	16.6	32.2	6.8	8.4	32.1	6.8	18.0	9.4	0.0	14.9	7.9	0.0
Queue Length 95th (m)	39.5	61.1	24.2	21.8	57.0	23.2	42.1	23.9	10.7	36.0	20.8	14.3
Internal Link Dist (m)		122.8			242.6			314.2			320.2	
Turn Bay Length (m)	55.0		7.0	50.0		7.0	35.0		7.0	35.0		7.0
Base Capacity (vph)	593	1642	735	691	1827	800	686	994	877	681	994	909
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.41	0.24	0.27	0.34	0.21	0.26	0.10	0.12	0.22	0.09	0.21

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 59.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay (s/veh): 17.8
Intersection LOS: B
Intersection Capacity Utilization 62.9%
ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Regency Park Drive/Parkland Drive & Lacewood Drive

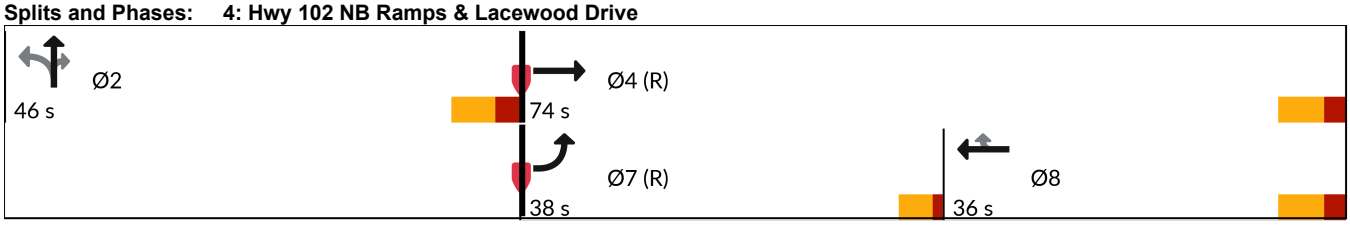


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	790	970	0	0	1015	305	305	5	395	0	0	0
Future Volume (vph)	790	970	0	0	1015	305	305	5	395	0	0	0
Satd. Flow (prot)	3433	3539	0	0	5085	1583	1681	1688	1583	0	0	0
Flt Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	3433	3539	0	0	5085	1583	1681	1688	1583	0	0	0
Satd. Flow (RTOR)						279			85			
Lane Group Flow (vph)	859	1054	0	0	1103	332	169	168	429	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Total Split (s)	38.0	74.0			36.0	36.0	46.0	46.0	46.0			
Total Lost Time (s)	4.0	6.0			6.0	6.0	6.0	6.0	6.0			
Act Effct Green (s)	38.5	75.7			33.2	33.2	32.3	32.3	32.3			
Actuated g/C Ratio	0.32	0.63			0.28	0.28	0.27	0.27	0.27			
v/c Ratio	0.78	0.47			0.78	0.52	0.37	0.37	0.88			
Control Delay (s/veh)	21.6	3.0			45.5	10.7	36.6	36.5	52.5			
Queue Delay	0.4	0.4			0.0	0.0	0.0	0.0	0.0			
Total Delay (s/veh)	22.0	3.4			45.5	10.7	36.6	36.5	52.5			
LOS	C	A			D	B	D	D	D			
Approach Delay (s/veh)		11.7			37.5			45.5				
Approach LOS		B			D			D				
Queue Length 50th (m)	24.4	23.5			96.3	10.2	35.2	35.0	82.7			
Queue Length 95th (m)	#96.2	8.2			114.7	38.3	52.5	52.4	116.9			
Internal Link Dist (m)		118.1			149.0			197.6			197.9	
Turn Bay Length (m)						60.0			60.0			
Base Capacity (vph)	1101	2232			1406	639	560	562	584			
Starvation Cap Reductn	43	618			0	0	0	0	0			
Spillback Cap Reductn	0	0			6	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.81	0.65			0.79	0.52	0.30	0.30	0.73			

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 52 (43%), Referenced to phase 4:EBT and 7:EBL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay (s/veh): 27.0 Intersection LOS: C
Intersection Capacity Utilization 64.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Hwy 102 NB Ramps & Lacewood Drive

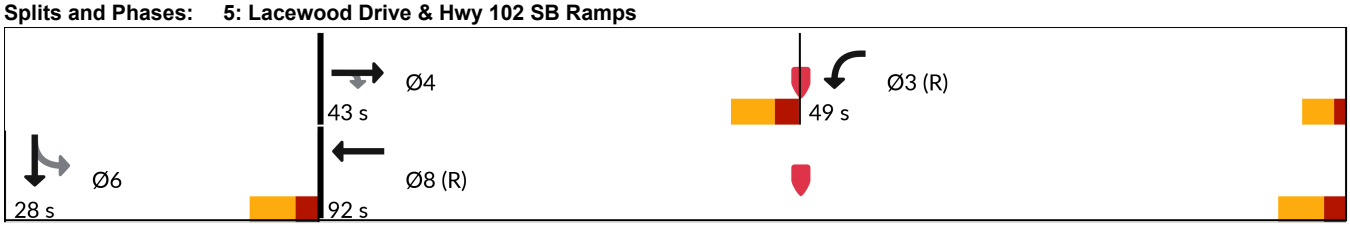


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1515	300	350	960	0	0	0	0	285	0	530
Future Volume (vph)	0	1515	300	350	960	0	0	0	0	285	0	530
Satd. Flow (prot)	0	6408	1583	1770	3539	0	0	0	0	1681	1681	1583
Flt Permitted				0.950						0.950	0.950	
Satd. Flow (perm)	0	6408	1490	1762	3539	0	0	0	0	1681	1681	1583
Satd. Flow (RTOR)			288									362
Lane Group Flow (vph)	0	1647	326	380	1043	0	0	0	0	155	155	576
Turn Type		NA	Perm	Prot	NA					Perm	NA	Free
Protected Phases		4		3	8						6	
Permitted Phases			4							6		Free
Total Split (s)		43.0	43.0	49.0	92.0					28.0	28.0	
Total Lost Time (s)		6.0	6.0	4.0	6.0					6.0	6.0	
Act Effct Green (s)		40.0	40.0	47.7	91.7					16.3	16.3	120.0
Actuated g/C Ratio		0.33	0.33	0.40	0.76					0.14	0.14	1.00
v/c Ratio		0.77	0.47	0.54	0.39					0.68	0.68	0.36
Control Delay (s/veh)		38.5	7.4	15.6	4.7					63.8	63.8	0.6
Queue Delay		0.1	0.0	0.7	0.3					0.0	0.0	0.0
Total Delay (s/veh)		38.6	7.4	16.2	5.0					63.8	63.8	0.6
LOS		D	A	B	A					E	E	A
Approach Delay (s/veh)		33.5			8.0						22.8	
Approach LOS		C			A						C	
Queue Length 50th (m)		103.6	6.3	23.5	31.9					39.0	39.0	0.0
Queue Length 95th (m)		119.0	29.6	m106.5	17.0					60.1	60.1	0.0
Internal Link Dist (m)		108.2			118.1			188.6			191.5	
Turn Bay Length (m)			70.0									90.0
Base Capacity (vph)		2163	693	728	2706					309	309	1583
Starvation Cap Reductn		0	0	119	886					0	0	0
Spillback Cap Reductn		40	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.78	0.47	0.62	0.57					0.50	0.50	0.36

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 108 (90%), Referenced to phase 3:WBL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay (s/veh): 22.8 Intersection LOS: C
Intersection Capacity Utilization 64.1% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Lacewood Drive & Hwy 102 SB Ramps

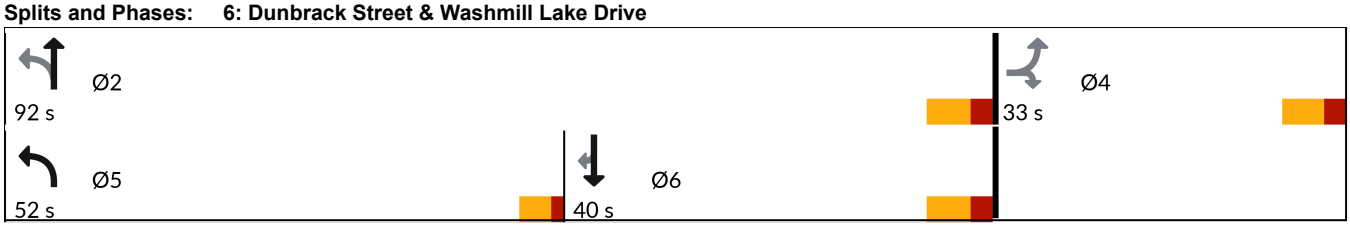


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	65	515	475	785	830	80
Future Volume (vph)	65	515	475	785	830	80
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.133			
Satd. Flow (perm)	1770	1583	248	3539	3539	1516
Satd. Flow (RTOR)		560				14
Lane Group Flow (vph)	71	560	516	853	902	87
Turn Type	Perm	Perm	pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4	4	2			6
Total Split (s)	33.0	33.0	52.0	92.0	40.0	40.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	11.1	11.1	67.3	65.2	29.0	29.0
Actuated g/C Ratio	0.12	0.12	0.76	0.73	0.33	0.33
v/c Ratio	0.32	0.81	0.70	0.33	0.78	0.17
Control Delay (s/veh)	42.9	14.2	21.5	4.9	34.9	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.9	14.2	21.5	4.9	34.9	23.5
LOS	D	B	C	A	C	C
Approach Delay (s/veh)	17.4			11.2	33.9	
Approach LOS	B			B	C	
Queue Length 50th (m)	11.8	0.0	51.8	19.6	70.8	8.5
Queue Length 95th (m)	28.9	35.2	121.7	51.0	#157.2	28.4
Internal Link Dist (m)	384.9			233.6	199.1	
Turn Bay Length (m)			120.0			7.0
Base Capacity (vph)	567	887	1056	3228	1428	619
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.63	0.49	0.26	0.63	0.14

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 89
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay (s/veh): 20.0 Intersection LOS: C
Intersection Capacity Utilization 66.8% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Dunbrack Street & Washmill Lake Drive



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	245	0	425	0	865	420	0	990	365
Future Volume (Veh/h)	0	0	0	245	0	425	0	865	420	0	990	365
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	266	0	462	0	940	457	0	1076	397
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						6						
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1546	2016	538	1478	2016	470	1076			940		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1546	2016	538	1478	2016	470	1076			940		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	100	14	100			100		
cM capacity (veh/h)	11	58	488	88	58	540	644			725		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	728	470	470	457	538	538	397
Volume Left	266	0	0	0	0	0	0
Volume Right	462	0	0	457	0	0	397
cSH	191	1700	1700	1700	1700	1700	1700
Volume to Capacity	3.81	0.28	0.28	0.27	0.32	0.32	0.23
Queue Length 95th (m)	Err	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s/veh)	Err	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	F						
Approach Delay (s/veh)	Err	0.0			0.0		
Approach LOS	F						

Intersection Summary				
Average Delay	2023.1			
Intersection Capacity Utilization	56.9%	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)	260	0	735	0	0	0	0	1030	110	0	1030	30
Future Volume (Veh/h)	260	0	735	0	0	0	0	1030	110	0	1030	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	283	0	799	0	0	0	0	1120	120	0	1120	33
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	1680	2240	560	1680	2240	560	1120			1120		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1680	2240	560	1680	2240	560	1120			1120		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	0	0	100	100	100			100		
cM capacity (veh/h)	62	42	472	0	42	472	619			619		

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	283	799	560	560	120	560	560	33
Volume Left	283	0	0	0	0	0	0	0
Volume Right	0	799	0	0	120	0	0	33
cSH	62	472	1700	1700	1700	1700	1700	1700
Volume to Capacity	4.58	1.69	0.33	0.33	0.07	0.33	0.33	0.02
Queue Length 95th (m)	Err	378.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s/veh)	Err	342.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	F						
Approach Delay (s/veh)	2868.2		0.0			0.0		
Approach LOS	F							

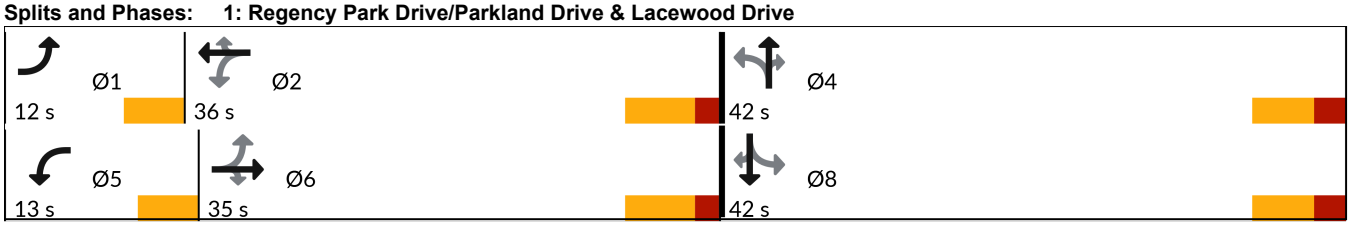
Intersection Summary				
Average Delay	893.1			
Intersection Capacity Utilization	80.6%	ICU Level of Service	D	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	423	115	117	288	95	102	74	175	166	105	124
Future Volume (vph)	76	423	115	117	288	95	102	74	175	166	105	124
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.562			0.422			0.684			0.705		
Satd. Flow (perm)	1016	3539	1504	775	3539	1482	1254	1863	1547	1300	1863	1536
Satd. Flow (RTOR)			88			88			190			135
Lane Group Flow (vph)	83	460	125	127	313	103	111	80	190	180	114	135
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2		2	4		4	8		8
Total Split (s)	12.0	35.0	35.0	13.0	36.0	36.0	42.0	42.0	42.0	42.0	42.0	42.0
Total Lost Time (s)	4.0	6.3	6.3	4.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Act Effct Green (s)	22.1	14.2	14.2	24.3	17.3	17.3	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.44	0.29	0.29	0.49	0.35	0.35	0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	0.15	0.46	0.25	0.23	0.25	0.18	0.34	0.16	0.35	0.53	0.23	0.27
Control Delay (s/veh)	7.7	18.2	8.8	8.1	14.8	6.6	19.3	16.2	5.1	23.2	16.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.7	18.2	8.8	8.1	14.8	6.6	19.3	16.2	5.1	23.2	16.9	5.2
LOS	A	B	A	A	B	A	B	B	A	C	B	A
Approach Delay (s/veh)		15.1			11.7			11.6			15.9	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	3.3	19.0	2.6	5.1	12.0	1.0	8.2	5.6	0.0	14.1	8.2	0.0
Queue Length 95th (m)	11.3	38.5	15.0	16.0	26.0	11.3	22.2	16.0	12.3	34.7	21.3	10.5
Internal Link Dist (m)		122.8			242.6			314.2			320.2	
Turn Bay Length (m)	55.0		7.0	50.0		7.0	35.0		7.0	35.0		7.0
Base Capacity (vph)	590	2159	952	572	2234	968	925	1374	1191	959	1374	1168
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.21	0.13	0.22	0.14	0.11	0.12	0.06	0.16	0.19	0.08	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 49.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay (s/veh): 13.7
Intersection LOS: B
Intersection Capacity Utilization 51.6%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Regency Park Drive/Parkland Drive & Lacewood Drive

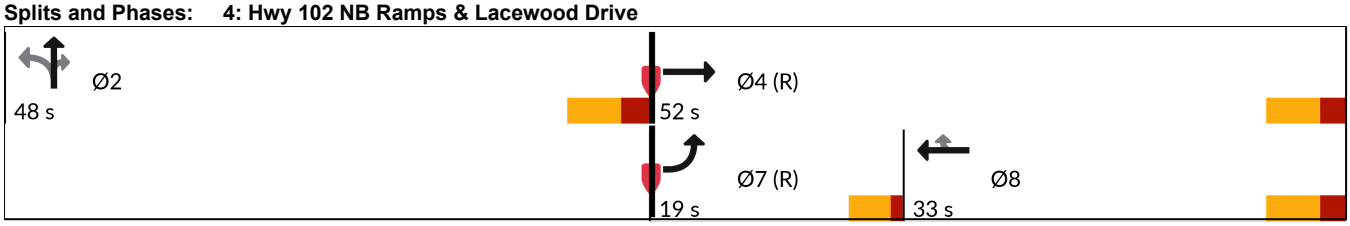


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	464	0	0	499	235	120	0	390	0	0	0
Future Volume (vph)	190	464	0	0	499	235	120	0	390	0	0	0
Satd. Flow (prot)	3433	3539	0	0	5085	1583	1681	1681	1583	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	3433	3539	0	0	5085	1583	1681	1681	1583	0	0	0
Satd. Flow (RTOR)						255			250			
Lane Group Flow (vph)	207	504	0	0	542	255	65	65	424	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Total Split (s)	19.0	52.0			33.0	33.0	48.0	48.0	48.0			
Total Lost Time (s)	4.0	6.0			6.0	6.0	6.0	6.0	6.0			
Act Effct Green (s)	48.3	69.1			16.8	16.8	18.9	18.9	18.9			
Actuated g/C Ratio	0.48	0.69			0.17	0.17	0.19	0.19	0.19			
v/c Ratio	0.12	0.21			0.63	0.53	0.21	0.21	0.85			
Control Delay (s/veh)	0.3	0.3			41.9	8.9	31.8	31.8	30.4			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay (s/veh)	0.3	0.3			41.9	8.9	31.8	31.8	30.4			
LOS	A	A			D	A	C	C	C			
Approach Delay (s/veh)		0.3			31.4			30.7				
Approach LOS		A			C			C				
Queue Length 50th (m)	0.1	0.0			38.1	0.0	11.8	11.8	35.3			
Queue Length 95th (m)	0.5	0.0			47.7	20.5	20.7	20.7	62.4			
Internal Link Dist (m)		118.1			149.0			197.6			197.9	
Turn Bay Length (m)						60.0			60.0			
Base Capacity (vph)	1659	2446			1372	613	706	706	809			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.12	0.21			0.40	0.42	0.09	0.09	0.52			

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 94 (94%), Referenced to phase 4:EBT and 7:EBL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay (s/veh): 20.5
Intersection LOS: C
Intersection Capacity Utilization 49.1%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Hwy 102 NB Ramps & Lacewood Drive

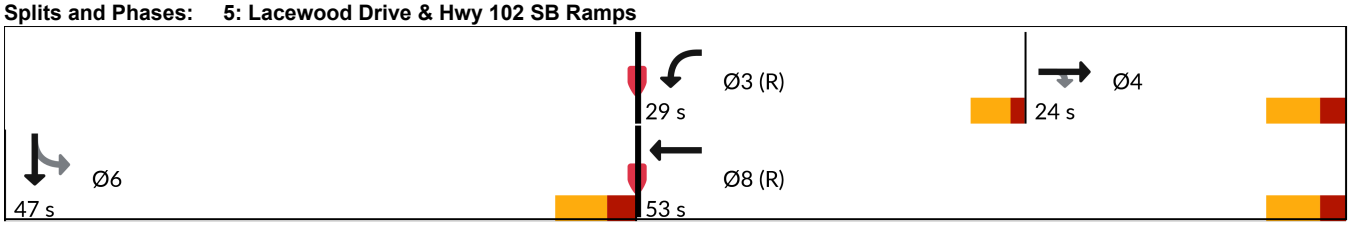


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	354	65	220	399	0	0	0	0	300	0	510
Future Volume (vph)	0	354	65	220	399	0	0	0	0	300	0	510
Satd. Flow (prot)	0	6408	1583	1770	3539	0	0	0	0	1681	1681	1583
Flt Permitted				0.950						0.950	0.950	
Satd. Flow (perm)	0	6408	1530	1755	3539	0	0	0	0	1681	1681	1583
Satd. Flow (RTOR)			76									554
Lane Group Flow (vph)	0	385	71	239	434	0	0	0	0	163	163	554
Turn Type		NA	Perm	Prot	NA					Perm	NA	Free
Protected Phases		4		3	8						6	
Permitted Phases			4							6		Free
Total Split (s)		24.0	24.0	29.0	53.0					47.0	47.0	
Total Lost Time (s)		6.0	6.0	4.0	6.0					6.0	6.0	
Act Effct Green (s)		11.5	11.5	57.3	72.8					15.2	15.2	100.0
Actuated g/C Ratio		0.12	0.12	0.57	0.73					0.15	0.15	1.00
v/c Ratio		0.52	0.29	0.24	0.17					0.64	0.64	0.35
Control Delay (s/veh)		44.0	11.9	2.1	0.3					50.6	50.6	0.6
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay (s/veh)		44.0	11.9	2.1	0.3					50.6	50.6	0.6
LOS		D	B	A	A					D	D	A
Approach Delay (s/veh)		39.0			0.9						19.1	
Approach LOS		D			A						B	
Queue Length 50th (m)		21.8	0.0	5.5	0.0					33.3	33.3	0.0
Queue Length 95th (m)		29.1	11.6	17.4	0.0					52.4	52.4	0.0
Internal Link Dist (m)		108.2			118.1			188.6			191.5	
Turn Bay Length (m)			70.0									90.0
Base Capacity (vph)		1153	337	1013	2576					689	689	1583
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.33	0.21	0.24	0.17					0.24	0.24	0.35

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 48 (48%), Referenced to phase 3:WBL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay (s/veh): 17.5
Intersection LOS: B
Intersection Capacity Utilization 49.1%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Lacewood Drive & Hwy 102 SB Ramps

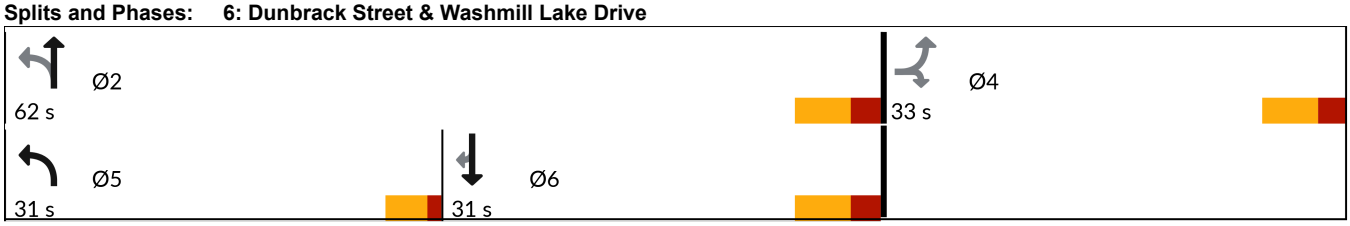


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	35	352	340	755	580	50
Future Volume (vph)	35	352	340	755	580	50
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.245			
Satd. Flow (perm)	1695	1468	456	3539	3539	1558
Satd. Flow (RTOR)		383				16
Lane Group Flow (vph)	38	383	370	821	630	54
Turn Type	Perm	Perm	pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4	4	2			6
Total Split (s)	33.0	33.0	31.0	62.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	12.7	12.7	42.7	40.4	17.1	17.1
Actuated g/C Ratio	0.19	0.19	0.64	0.61	0.26	0.26
v/c Ratio	0.12	0.65	0.56	0.38	0.69	0.13
Control Delay (s/veh)	24.6	8.7	11.1	8.2	29.1	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.6	8.7	11.1	8.2	29.1	19.3
LOS	C	A	B	A	C	B
Approach Delay (s/veh)	10.2			9.1	28.3	
Approach LOS	B			A	C	
Queue Length 50th (m)	3.7	0.0	11.1	15.8	30.6	3.0
Queue Length 95th (m)	13.1	22.0	54.4	53.8	76.9	15.0
Internal Link Dist (m)	384.9			204.0	199.1	
Turn Bay Length (m)			120.0			7.0
Base Capacity (vph)	766	873	887	2975	1482	662
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.44	0.42	0.28	0.43	0.08

Intersection Summary

Cycle Length: 95
Actuated Cycle Length: 66.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay (s/veh): 15.0
Intersection LOS: B
Intersection Capacity Utilization 68.4%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Dunbrack Street & Washmill Lake Drive

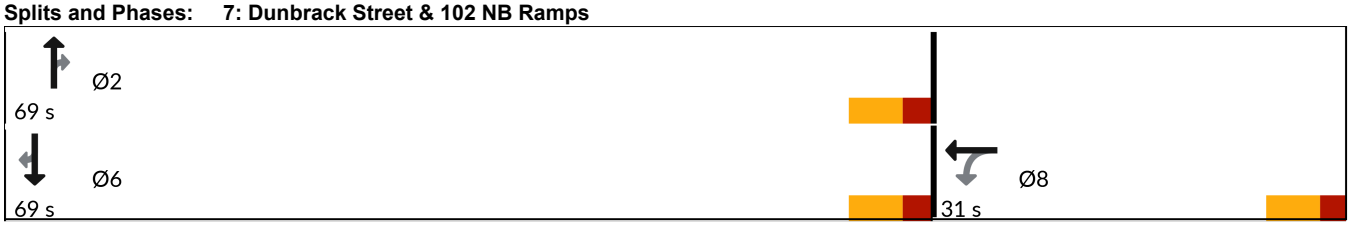


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	110	0	175	0	925	400	0	636	281
Future Volume (vph)	0	0	0	110	0	175	0	925	400	0	636	281
Satd. Flow (prot)	0	0	0	0	1770	1583	0	3539	1583	0	3539	1583
Flt Permitted					0.950							
Satd. Flow (perm)	0	0	0	0	1770	1583	0	3539	1583	0	3539	1583
Satd. Flow (RTOR)						190			435			234
Lane Group Flow (vph)	0	0	0	0	120	190	0	1005	435	0	691	305
Turn Type				Perm	NA	Free		NA	Perm		NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8		Free			2			6
Total Split (s)				31.0	31.0			69.0	69.0		69.0	69.0
Total Lost Time (s)					6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)					9.1	47.8		31.5	31.5		31.5	31.5
Actuated g/C Ratio					0.19	1.00		0.66	0.66		0.66	0.66
v/c Ratio					0.36	0.12		0.43	0.36		0.30	0.27
Control Delay (s/veh)					21.2	0.2		6.7	1.8		5.8	2.5
Queue Delay					0.0	0.0		0.0	0.0		0.0	0.0
Total Delay (s/veh)					21.2	0.2		6.7	1.8		5.8	2.5
LOS					C	A		A	A		A	A
Approach Delay (s/veh)					8.3			5.2			4.8	
Approach LOS					A			A			A	
Queue Length 50th (m)					9.9	0.0		24.7	0.0		15.1	2.5
Queue Length 95th (m)					22.4	0.0		42.6	9.6		26.9	12.0
Internal Link Dist (m)		132.3			134.0			231.5			165.7	
Turn Bay Length (m)						60.0			50.0			15.0
Base Capacity (vph)					950	1583		3539	1583		3539	1583
Starvation Cap Reductn					0	0		0	0		0	0
Spillback Cap Reductn					0	0		0	0		0	0
Storage Cap Reductn					0	0		0	0		0	0
Reduced v/c Ratio					0.13	0.12		0.28	0.27		0.20	0.19

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 47.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay (s/veh): 5.4
Intersection LOS: A
Intersection Capacity Utilization 41.7%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 7: Dunbrack Street & 102 NB Ramps

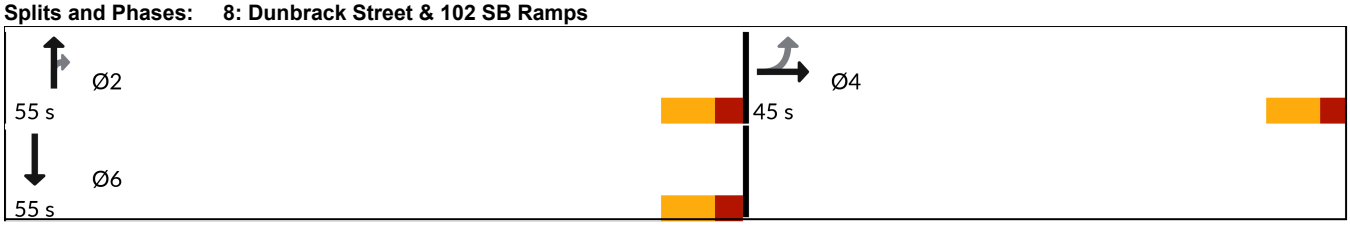


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	370	40	800	0	0	0	0	955	515	0	365	46
Future Volume (vph)	370	40	800	0	0	0	0	955	515	0	365	46
Satd. Flow (prot)	0	1783	1583	0	0	0	0	3539	1583	0	3539	1583
Flt Permitted		0.957										
Satd. Flow (perm)	0	1783	1583	0	0	0	0	3539	1583	0	3539	1583
Satd. Flow (RTOR)			697						434			98
Lane Group Flow (vph)	0	445	870	0	0	0	0	1038	560	0	397	50
Turn Type	Perm	NA	Free					NA	Perm		NA	Free
Protected Phases		4						2			6	
Permitted Phases	4		Free						2			Free
Total Split (s)	45.0	45.0						55.0	55.0		55.0	
Total Lost Time (s)		6.0						6.0	6.0		6.0	
Act Effct Green (s)		22.3	64.3					29.1	29.1		29.1	64.3
Actuated g/C Ratio		0.35	1.00					0.45	0.45		0.45	1.00
v/c Ratio		0.72	0.55					0.65	0.59		0.25	0.03
Control Delay (s/veh)		26.9	1.4					16.3	6.2		11.9	0.0
Queue Delay		0.0	0.0					0.0	0.0		0.0	0.0
Total Delay (s/veh)		26.9	1.4					16.3	6.2		11.9	0.0
LOS		C	A					B	A		B	A
Approach Delay (s/veh)		10.0						12.8			10.6	
Approach LOS		B						B			B	
Queue Length 50th (m)		44.2	0.0					46.5	8.3		14.2	0.0
Queue Length 95th (m)		102.0	0.0					94.1	39.5		31.7	0.0
Internal Link Dist (m)		153.7			159.2			222.4			231.5	
Turn Bay Length (m)									40.0			55.0
Base Capacity (vph)		1165	1583					2794	1341		2794	1583
Starvation Cap Reductn		0	0					0	0		0	0
Spillback Cap Reductn		0	0					0	0		0	0
Storage Cap Reductn		0	0					0	0		0	0
Reduced v/c Ratio		0.38	0.55					0.37	0.42		0.14	0.03

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 64.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay (s/veh): 11.4
Intersection LOS: B
Intersection Capacity Utilization 64.5%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 8: Dunbrack Street & 102 SB Ramps



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	80	375	510	17	22	68
Future Volume (Veh/h)	80	375	510	17	22	68
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	408	554	18	24	74
Pedestrians			5		10	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	582				956	296
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	582				956	296
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				90	89
cM capacity (veh/h)	980				230	694

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	87	204	204	369	203	98
Volume Left	87	0	0	0	0	24
Volume Right	0	0	0	0	18	74
cSH	980	1700	1700	1700	1700	465
Volume to Capacity	0.09	0.12	0.12	0.22	0.12	0.21
Queue Length 95th (m)	2.3	0.0	0.0	0.0	0.0	6.3
Control Delay (s/veh)	9.0	0.0	0.0	0.0	0.0	14.8
Lane LOS	A					B
Approach Delay (s/veh)	1.6			0.0		14.8
Approach LOS						B

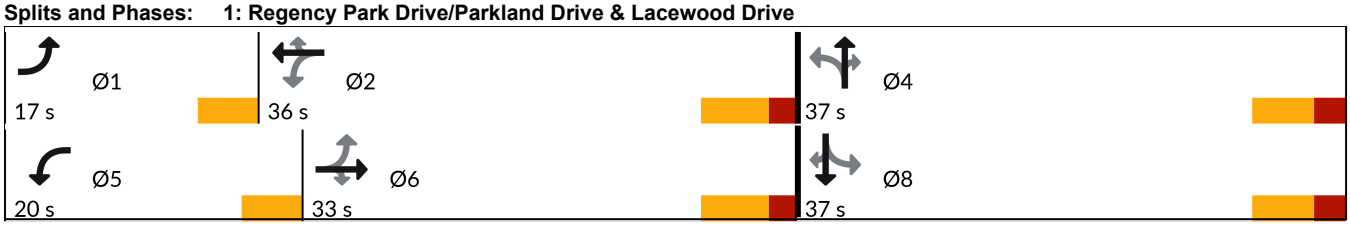
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	554	136	219	518	147	140	164	152	133	122	140
Future Volume (vph)	244	554	136	219	518	147	140	164	152	133	122	140
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.422			0.347			0.672			0.645		
Satd. Flow (perm)	768	3539	1482	637	3539	1467	1234	1863	1553	1195	1863	1538
Satd. Flow (RTOR)			88			88			106			130
Lane Group Flow (vph)	265	602	148	238	563	160	152	178	165	145	133	152
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2		2	4		4	8		8
Total Split (s)	17.0	33.0	33.0	20.0	36.0	36.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Lost Time (s)	4.0	6.3	6.3	4.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Act Effct Green (s)	28.7	16.4	16.4	30.2	17.1	17.1	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.50	0.29	0.29	0.53	0.30	0.30	0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.48	0.60	0.31	0.44	0.53	0.32	0.54	0.42	0.38	0.53	0.31	0.34
Control Delay (s/veh)	10.0	21.5	10.7	9.2	19.6	10.8	28.9	23.4	11.5	28.9	21.9	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	10.0	21.5	10.7	9.2	19.6	10.8	28.9	23.4	11.5	28.9	21.9	8.4
LOS	A	C	B	A	B	B	C	C	B	C	C	A
Approach Delay (s/veh)		16.9			15.6			21.1			19.5	
Approach LOS		B			B			C			B	
Queue Length 50th (m)	11.8	28.4	4.7	10.3	25.7	5.5	14.1	16.0	5.0	13.4	11.7	1.8
Queue Length 95th (m)	30.8	57.7	20.5	27.6	50.6	21.4	37.1	39.2	21.7	35.8	30.3	16.0
Internal Link Dist (m)		122.8			242.6			314.2			320.2	
Turn Bay Length (m)	55.0		7.0	50.0		7.0	35.0		7.0	35.0		7.0
Base Capacity (vph)	661	1718	764	700	1911	832	688	1040	913	667	1040	916
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.35	0.19	0.34	0.29	0.19	0.22	0.17	0.18	0.22	0.13	0.17

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 57.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay (s/veh): 17.6
Intersection LOS: B
Intersection Capacity Utilization 66.4%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Regency Park Drive/Parkland Drive & Lacewood Drive

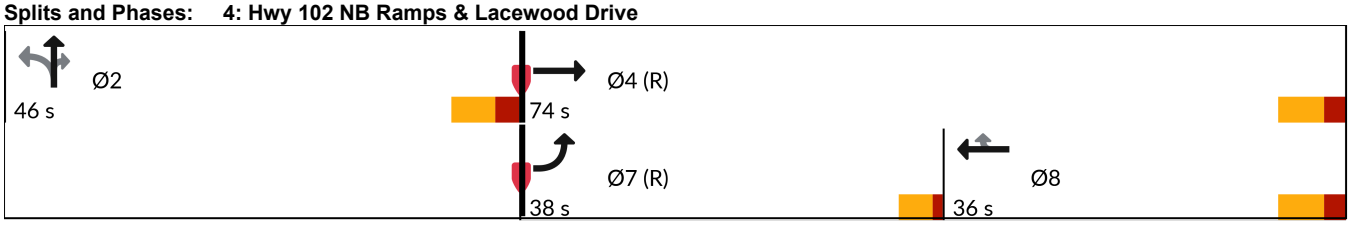


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	790	859	0	0	898	305	305	5	395	0	0	0
Future Volume (vph)	790	859	0	0	898	305	305	5	395	0	0	0
Satd. Flow (prot)	3433	3539	0	0	5085	1583	1681	1688	1583	0	0	0
Flt Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	3433	3539	0	0	5085	1583	1681	1688	1583	0	0	0
Satd. Flow (RTOR)						315			114			
Lane Group Flow (vph)	859	934	0	0	976	332	169	168	429	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Total Split (s)	38.0	74.0			36.0	36.0	46.0	46.0	46.0			
Total Lost Time (s)	4.0	6.0			6.0	6.0	6.0	6.0	6.0			
Act Effct Green (s)	44.4	77.1			28.7	28.7	30.9	30.9	30.9			
Actuated g/C Ratio	0.37	0.64			0.24	0.24	0.26	0.26	0.26			
v/c Ratio	0.68	0.41			0.80	0.54	0.39	0.39	0.87			
Control Delay (s/veh)	11.4	3.6			48.6	8.5	37.9	37.8	49.2			
Queue Delay	1.5	0.5			0.2	0.0	0.0	0.0	0.0			
Total Delay (s/veh)	12.9	4.1			48.8	8.5	37.9	37.8	49.2			
LOS	B	A			D	A	D	D	D			
Approach Delay (s/veh)		8.3			38.6			44.2				
Approach LOS		A			D			D				
Queue Length 50th (m)	117.6	79.6			82.1	3.2	36.0	35.7	76.7			
Queue Length 95th (m)	#139.6	3.2			99.4	28.3	52.5	52.4	109.1			
Internal Link Dist (m)		118.1			149.0			197.6			197.9	
Turn Bay Length (m)						60.0			60.0			
Base Capacity (vph)	1271	2274			1274	633	560	562	603			
Starvation Cap Reductn	232	804			0	0	0	0	0			
Spillback Cap Reductn	0	0			33	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.83	0.64			0.79	0.52	0.30	0.30	0.71			

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 61 (51%), Referenced to phase 4:EBT and 7:EBL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay (s/veh): 25.7 Intersection LOS: C
Intersection Capacity Utilization 63.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Hwy 102 NB Ramps & Lacewood Drive

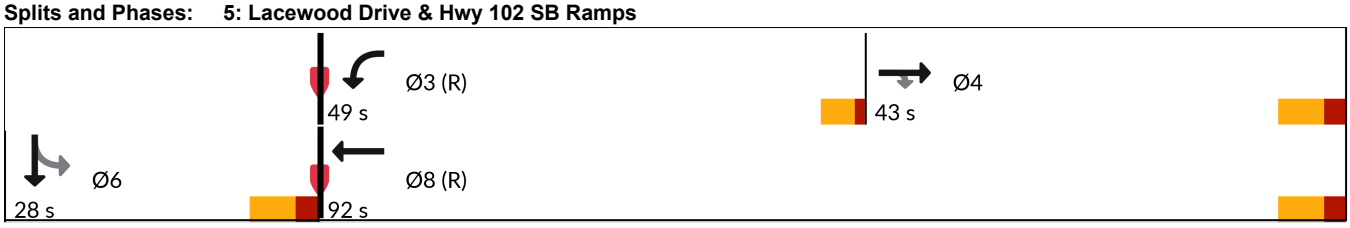


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1364	300	350	853	0	0	0	0	285	0	530
Future Volume (vph)	0	1364	300	350	853	0	0	0	0	285	0	530
Satd. Flow (prot)	0	6408	1583	1770	3539	0	0	0	0	1681	1681	1583
Flt Permitted				0.950						0.950	0.950	
Satd. Flow (perm)	0	6408	1490	1761	3539	0	0	0	0	1681	1681	1583
Satd. Flow (RTOR)			320									389
Lane Group Flow (vph)	0	1483	326	380	927	0	0	0	0	155	155	576
Turn Type		NA	Perm	Prot	NA					Perm	NA	Free
Protected Phases		4		3	8						6	
Permitted Phases			4							6		Free
Total Split (s)		43.0	43.0	49.0	92.0					28.0	28.0	
Total Lost Time (s)		6.0	6.0	4.0	6.0					6.0	6.0	
Act Effct Green (s)		37.3	37.3	50.5	91.8					16.2	16.2	120.0
Actuated g/C Ratio		0.31	0.31	0.42	0.77					0.14	0.14	1.00
v/c Ratio		0.74	0.48	0.51	0.34					0.68	0.68	0.36
Control Delay (s/veh)		39.4	5.8	6.2	1.8					64.1	64.1	0.6
Queue Delay		0.3	0.0	0.5	0.2					0.0	0.0	0.0
Total Delay (s/veh)		39.6	5.8	6.8	2.1					64.1	64.1	0.6
LOS		D	A	A	A					E	E	A
Approach Delay (s/veh)		33.5			3.4						22.9	
Approach LOS		C			A						C	
Queue Length 50th (m)		95.0	1.0	8.3	0.0					39.0	39.0	0.0
Queue Length 95th (m)		103.8	21.4	m132.3	96.1					60.3	60.3	0.0
Internal Link Dist (m)		108.2			118.1			188.6			191.5	
Turn Bay Length (m)			70.0									90.0
Base Capacity (vph)		2071	698	759	2706					308	308	1583
Starvation Cap Reductn		0	0	120	943					0	0	0
Spillback Cap Reductn		137	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.77	0.47	0.59	0.53					0.50	0.50	0.36

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 3:WBL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay (s/veh): 21.3 Intersection LOS: C
Intersection Capacity Utilization 63.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Lacewood Drive & Hwy 102 SB Ramps

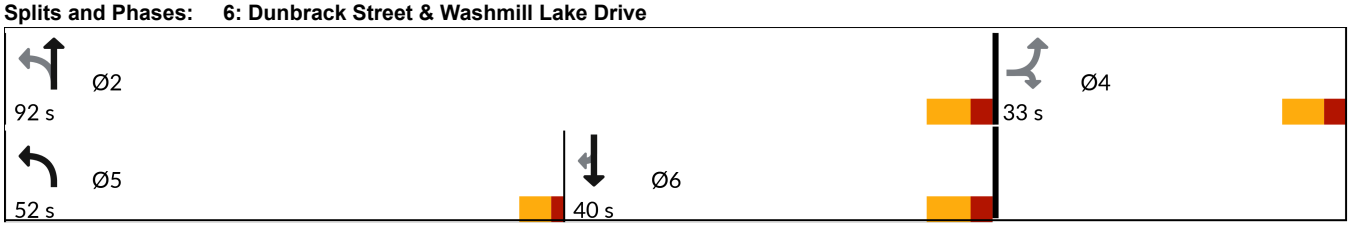


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	65	535	475	785	830	80
Future Volume (vph)	65	535	475	785	830	80
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.133			
Satd. Flow (perm)	1770	1583	248	3539	3539	1543
Satd. Flow (RTOR)		582				14
Lane Group Flow (vph)	71	582	516	853	902	87
Turn Type	Perm	Perm	pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4	4	2			6
Total Split (s)	33.0	33.0	52.0	92.0	40.0	40.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	11.3	11.3	67.4	65.3	29.0	29.0
Actuated g/C Ratio	0.13	0.13	0.75	0.73	0.32	0.32
v/c Ratio	0.32	0.82	0.70	0.33	0.79	0.17
Control Delay (s/veh)	42.7	14.2	21.7	5.0	35.2	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.7	14.2	21.7	5.0	35.2	23.6
LOS	D	B	C	A	D	C
Approach Delay (s/veh)	17.3			11.3	34.1	
Approach LOS	B			B	C	
Queue Length 50th (m)	11.8	0.0	51.8	19.6	70.8	8.5
Queue Length 95th (m)	28.9	36.0	123.5	52.5	#159.1	28.6
Internal Link Dist (m)	384.9			204.0	199.1	
Turn Bay Length (m)			120.0			7.0
Base Capacity (vph)	566	902	1054	3222	1425	629
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.65	0.49	0.26	0.63	0.14

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 89.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay (s/veh): 20.1 Intersection LOS: C
Intersection Capacity Utilization 66.8% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Dunbrack Street & Washmill Lake Drive



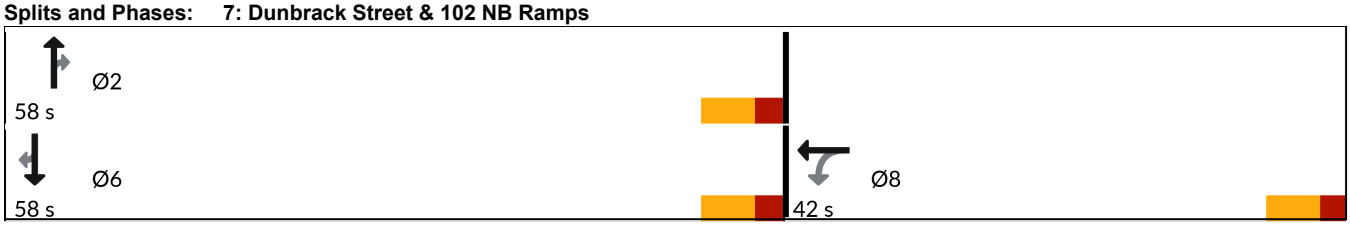
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	245	0	425	0	865	420	0	1000	375
Future Volume (vph)	0	0	0	245	0	425	0	865	420	0	1000	375
Satd. Flow (prot)	0	0	0	0	1770	1583	0	3539	1583	0	3539	1583
Flt Permitted					0.950							
Satd. Flow (perm)	0	0	0	0	1770	1583	0	3539	1583	0	3539	1583
Satd. Flow (RTOR)						462			457			154
Lane Group Flow (vph)	0	0	0	0	266	462	0	940	457	0	1087	408
Turn Type				Perm	NA	Free		NA	Perm		NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8		Free			2			6
Total Split (s)				42.0	42.0			58.0	58.0		58.0	58.0
Total Lost Time (s)					6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)					14.4	53.1		26.3	26.3		26.3	26.3
Actuated g/C Ratio					0.27	1.00		0.50	0.50		0.50	0.50
v/c Ratio					0.56	0.29		0.54	0.45		0.62	0.47
Control Delay (s/veh)					22.5	0.5		10.9	2.6		12.0	7.7
Queue Delay					0.0	0.0		0.0	0.0		0.0	0.0
Total Delay (s/veh)					22.5	0.5		10.9	2.6		12.0	7.7
LOS					C	A		B	A		B	A
Approach Delay (s/veh)					8.5			8.2			10.8	
Approach LOS					A			A			B	
Queue Length 50th (m)					21.3	0.0		29.7	0.0		36.3	13.3
Queue Length 95th (m)					51.3	0.0		57.4	12.6		69.7	38.8
Internal Link Dist (m)		132.3			134.0			231.5			165.7	
Turn Bay Length (m)						60.0			50.0			15.0
Base Capacity (vph)					1242	1583		3279	1500		3279	1478
Starvation Cap Reductn					0	0		0	0		0	0
Spillback Cap Reductn					0	0		0	0		0	0
Storage Cap Reductn					0	0		0	0		0	0
Reduced v/c Ratio					0.21	0.29		0.29	0.30		0.33	0.28

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 53.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay (s/veh): 9.3
Intersection Capacity Utilization 51.2%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 7: Dunbrack Street & 102 NB Ramps



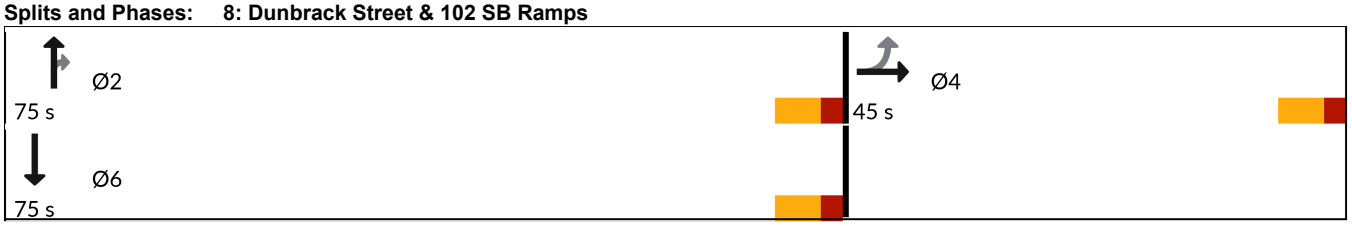
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	0	735	0	0	0	0	1030	110	0	1030	40
Future Volume (vph)	260	0	735	0	0	0	0	1030	110	0	1030	40
Satd. Flow (prot)	0	1770	1583	0	0	0	0	3539	1583	0	3539	1583
Flt Permitted		0.950										
Satd. Flow (perm)	0	1770	1583	0	0	0	0	3539	1583	0	3539	1583
Satd. Flow (RTOR)			446						86			82
Lane Group Flow (vph)	0	283	799	0	0	0	0	1120	120	0	1120	43
Turn Type	Perm	NA	Free					NA	Perm		NA	Free
Protected Phases		4						2			6	
Permitted Phases	4		Free						2			Free
Total Split (s)	45.0	45.0						75.0	75.0		75.0	
Total Lost Time (s)		6.0						6.0	6.0		6.0	
Act Effct Green (s)		15.0	54.1					26.6	26.6		26.6	54.1
Actuated g/C Ratio		0.28	1.00					0.49	0.49		0.49	1.00
v/c Ratio		0.58	0.50					0.64	0.15		0.64	0.03
Control Delay (s/veh)		23.1	1.2					12.5	3.9		12.5	0.0
Queue Delay		0.0	0.0					0.0	0.0		0.0	0.0
Total Delay (s/veh)		23.1	1.2					12.5	3.9		12.5	0.0
LOS		C	A					B	A		B	A
Approach Delay (s/veh)		6.9						11.7			12.1	
Approach LOS		A						B			B	
Queue Length 50th (m)		23.2	0.0					39.2	1.6		39.2	0.0
Queue Length 95th (m)		55.6	0.0					73.4	9.5		73.4	0.0
Internal Link Dist (m)		153.7			159.2			222.4			231.5	
Turn Bay Length (m)									40.0			55.0
Base Capacity (vph)		1325	1583					3505	1568		3505	1583
Starvation Cap Reductn		0	0					0	0		0	0
Spillback Cap Reductn		0	0					0	0		0	0
Storage Cap Reductn		0	0					0	0		0	0
Reduced v/c Ratio		0.21	0.50					0.32	0.08		0.32	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 54.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay (s/veh): 10.3
Intersection Capacity Utilization 52.9%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service A

Splits and Phases: 8: Dunbrack Street & 102 SB Ramps



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	139	865	700	25	20	104
Future Volume (Veh/h)	139	865	700	25	20	104
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	151	940	761	27	22	113
Pedestrians			5		10	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	798				1562	404
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	798				1562	404
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	81				73	81
cM capacity (veh/h)	813				83	591

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	151	470	470	507	281	135
Volume Left	151	0	0	0	0	22
Volume Right	0	0	0	0	27	113
cSH	813	1700	1700	1700	1700	295
Volume to Capacity	0.19	0.28	0.28	0.30	0.17	0.46
Queue Length 95th (m)	5.4	0.0	0.0	0.0	0.0	18.2
Control Delay (s/veh)	10.4	0.0	0.0	0.0	0.0	27.1
Lane LOS	B					D
Approach Delay (s/veh)	1.4			0.0		27.1
Approach LOS						D

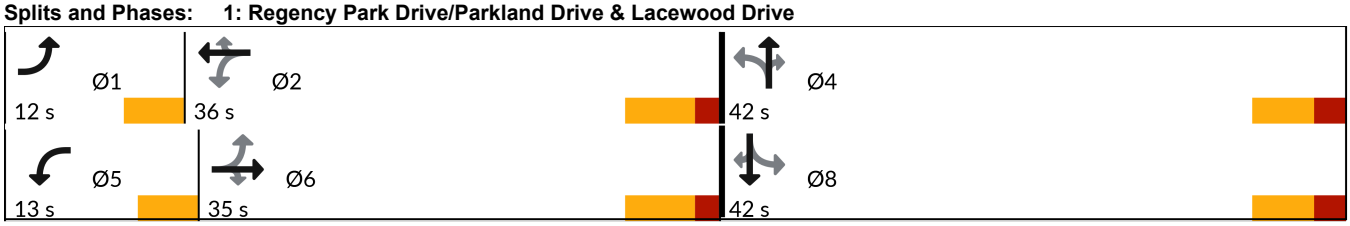
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	443	199	167	329	93	243	103	263	166	122	124
Future Volume (vph)	76	443	199	167	329	93	243	103	263	166	122	124
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.538			0.385			0.672			0.685		
Satd. Flow (perm)	975	3539	1478	702	3539	1482	1220	1863	1536	1256	1863	1517
Satd. Flow (RTOR)			94			88			286			126
Lane Group Flow (vph)	83	482	216	182	358	101	264	112	286	180	133	135
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2		2	4		4	8		8
Total Split (s)	12.0	35.0	35.0	13.0	36.0	36.0	42.0	42.0	42.0	42.0	42.0	42.0
Total Lost Time (s)	4.0	6.3	6.3	4.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Act Effct Green (s)	25.2	15.2	15.2	28.2	19.1	19.1	18.6	18.6	18.6	18.6	18.6	18.6
Actuated g/C Ratio	0.42	0.26	0.26	0.47	0.32	0.32	0.31	0.31	0.31	0.31	0.31	0.31
v/c Ratio	0.16	0.53	0.48	0.37	0.32	0.19	0.69	0.19	0.42	0.46	0.23	0.24
Control Delay (s/veh)	10.5	22.8	16.4	12.2	19.0	7.5	28.6	15.8	4.3	20.7	16.2	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	10.5	22.8	16.4	12.2	19.0	7.5	28.6	15.8	4.3	20.7	16.2	5.1
LOS	B	C	B	B	B	A	C	B	A	C	B	A
Approach Delay (s/veh)		19.7			15.3			16.0			14.7	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	4.3	24.4	11.1	10.0	16.4	1.0	25.3	8.9	0.0	15.8	10.8	0.7
Queue Length 95th (m)	14.6	48.0	34.9	28.8	35.0	12.5	54.8	21.5	14.3	35.7	24.7	11.1
Internal Link Dist (m)		122.8			242.6			314.2			320.2	
Turn Bay Length (m)	55.0		7.0	50.0		7.0	35.0		7.0	35.0		7.0
Base Capacity (vph)	534	1765	784	502	1827	807	757	1156	1061	779	1156	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.27	0.28	0.36	0.20	0.13	0.35	0.10	0.27	0.23	0.12	0.14

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 59.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay (s/veh): 16.7
Intersection LOS: B
Intersection Capacity Utilization 68.9%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Regency Park Drive/Parkland Drive & Lacewood Drive

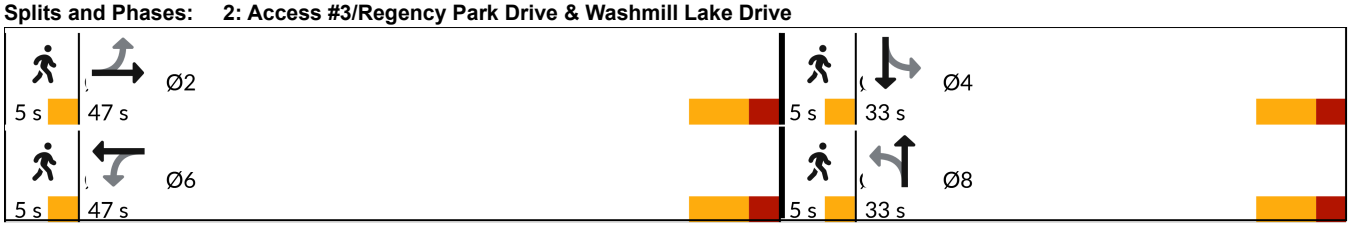


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	403	5	13	620	67	13	40	36	220	15	105
Future Volume (vph)	125	403	5	13	620	67	13	40	36	220	15	105
Satd. Flow (prot)	1770	3530	0	1770	3458	0	0	1731	0	1770	1583	0
Flt Permitted	0.268			0.480				0.955		0.695		
Satd. Flow (perm)	491	3530	0	877	3458	0	0	1662	0	1281	1583	0
Satd. Flow (RTOR)		2			17			39			114	
Lane Group Flow (vph)	136	443	0	14	747	0	0	96	0	239	130	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	47.0	47.0		47.0	47.0		33.0	33.0		33.0	33.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Act Effct Green (s)	24.6	24.6		24.6	24.6			23.2		23.2	23.2	
Actuated g/C Ratio	0.35	0.35		0.35	0.35			0.33		0.33	0.33	
v/c Ratio	0.80	0.36		0.05	0.61			0.17		0.57	0.22	
Control Delay (s/veh)	52.5	17.2		14.4	20.2			13.8		27.8	7.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay (s/veh)	52.5	17.2		14.4	20.2			13.8		27.8	7.0	
LOS	D	B		B	C			B		C	A	
Approach Delay (s/veh)		25.5			20.1			13.8			20.4	
Approach LOS		C			C			B			C	
Queue Length 50th (m)	15.9	22.4		1.2	41.3			4.9		24.0	1.3	
Queue Length 95th (m)	#45.6	35.9		4.9	62.4			19.2		63.5	15.0	
Internal Link Dist (m)		518.2			383.0			43.2			228.7	
Turn Bay Length (m)	20.0			15.0						25.0		
Base Capacity (vph)	291	2101		521	2064			674		501	689	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.47	0.21		0.03	0.36			0.14		0.48	0.19	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 70.3
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.80
Intersection Signal Delay (s/veh): 21.6
Intersection LOS: C
Intersection Capacity Utilization 60.3%
ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Access #3/Regency Park Drive & Washmill Lake Drive



Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Total Split (s)	5.0	5.0	5.0	5.0
Total Lost Time (s)				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay (s/veh)				
Queue Delay				
Total Delay (s/veh)				
LOS				
Approach Delay (s/veh)				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

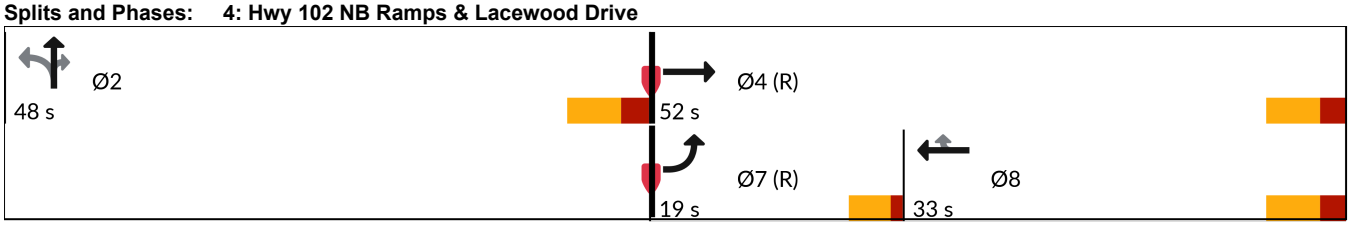
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	532	0	0	654	348	120	0	452	0	0	0
Future Volume (vph)	190	532	0	0	654	348	120	0	452	0	0	0
Satd. Flow (prot)	3433	3539	0	0	5085	1583	1681	1681	1583	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	3433	3539	0	0	5085	1583	1681	1681	1583	0	0	0
Satd. Flow (RTOR)						378			201			
Lane Group Flow (vph)	207	578	0	0	711	378	65	65	491	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Total Split (s)	19.0	52.0			33.0	33.0	48.0	48.0	48.0			
Total Lost Time (s)	4.0	6.0			6.0	6.0	6.0	6.0	6.0			
Act Effct Green (s)	35.8	61.0			21.2	21.2	27.0	27.0	27.0			
Actuated g/C Ratio	0.36	0.61			0.21	0.21	0.27	0.27	0.27			
v/c Ratio	0.17	0.27			0.66	0.60	0.14	0.14	0.86			
Control Delay (s/veh)	2.1	1.0			38.9	7.6	24.8	24.8	34.0			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay (s/veh)	2.1	1.0			38.9	7.6	24.8	24.8	34.0			
LOS	A	A			D	A	C	C	C			
Approach Delay (s/veh)		1.3			28.0			32.1				
Approach LOS		A			C			C				
Queue Length 50th (m)	0.0	0.0			49.1	0.0	10.6	10.6	58.8			
Queue Length 95th (m)	25.8	12.7			58.4	22.6	18.2	18.2	84.9			
Internal Link Dist (m)		118.1			149.0			197.6			197.9	
Turn Bay Length (m)						60.0			60.0			
Base Capacity (vph)	1230	2159			1372	703	706	706	781			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.17	0.27			0.52	0.54	0.09	0.09	0.63			

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 94 (94%), Referenced to phase 4:EBT and 7:EBL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay (s/veh): 20.6
Intersection LOS: C
Intersection Capacity Utilization 53.0%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Hwy 102 NB Ramps & Lacewood Drive

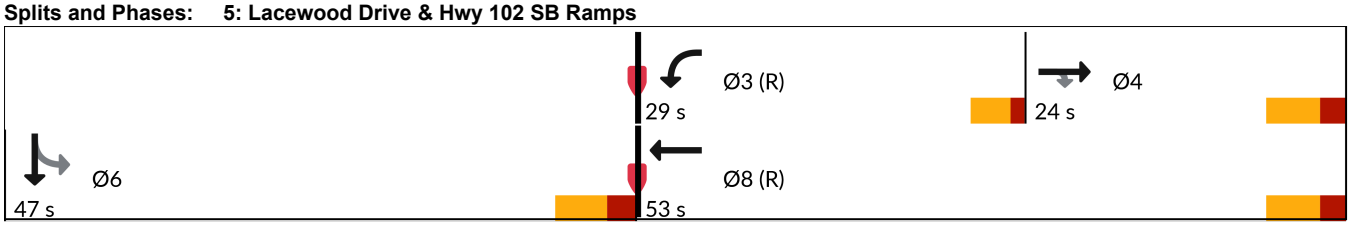


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	416	65	257	512	0	0	0	0	321	0	510
Future Volume (vph)	0	416	65	257	512	0	0	0	0	321	0	510
Satd. Flow (prot)	0	6408	1583	1770	3539	0	0	0	0	1681	1681	1583
Flt Permitted				0.950						0.950	0.950	
Satd. Flow (perm)	0	6408	1530	1756	3539	0	0	0	0	1681	1681	1583
Satd. Flow (RTOR)			76									554
Lane Group Flow (vph)	0	452	71	279	557	0	0	0	0	174	175	554
Turn Type		NA	Perm	Prot	NA					Perm	NA	Free
Protected Phases		4		3	8						6	
Permitted Phases			4							6		Free
Total Split (s)		24.0	24.0	29.0	53.0					47.0	47.0	
Total Lost Time (s)		6.0	6.0	4.0	6.0					6.0	6.0	
Act Effct Green (s)		12.5	12.5	55.6	72.1					15.9	15.9	100.0
Actuated g/C Ratio		0.13	0.13	0.56	0.72					0.16	0.16	1.00
v/c Ratio		0.57	0.28	0.28	0.22					0.65	0.66	0.35
Control Delay (s/veh)		43.8	11.3	1.9	0.4					50.2	50.4	0.6
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay (s/veh)		43.8	11.3	1.9	0.4					50.2	50.4	0.6
LOS		D	B	A	A					D	D	A
Approach Delay (s/veh)		39.4			0.9						19.8	
Approach LOS		D			A						B	
Queue Length 50th (m)		25.6	0.0	3.8	0.0					35.4	35.6	0.0
Queue Length 95th (m)		33.2	11.5	0.0	0.9					54.9	55.2	0.0
Internal Link Dist (m)		108.2			118.1			188.6			191.5	
Turn Bay Length (m)			70.0									90.0
Base Capacity (vph)		1153	337	983	2550					689	689	1583
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.39	0.21	0.28	0.22					0.25	0.25	0.35

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 48 (48%), Referenced to phase 3:WBL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay (s/veh): 17.4
Intersection LOS: B
Intersection Capacity Utilization 53.0%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Lacewood Drive & Hwy 102 SB Ramps

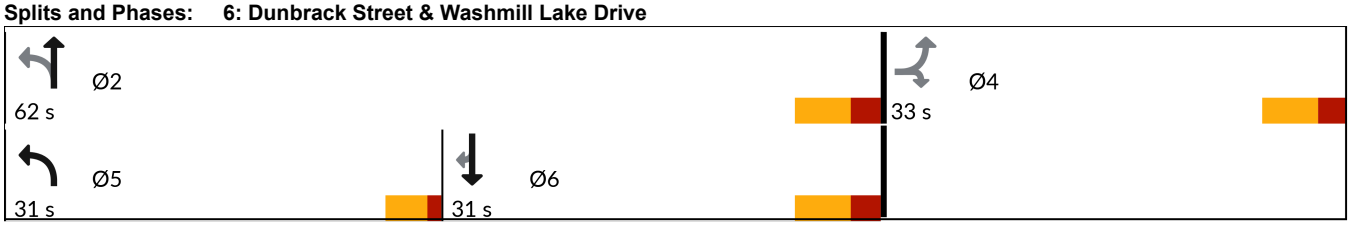


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	140	457	417	755	580	127
Future Volume (vph)	140	457	417	755	580	127
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.228			
Satd. Flow (perm)	1676	1458	424	3539	3539	1558
Satd. Flow (RTOR)		497				61
Lane Group Flow (vph)	152	497	453	821	630	138
Turn Type	Perm	Perm	pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4	4	2			6
Total Split (s)	33.0	33.0	31.0	62.0	31.0	31.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	15.2	15.2	46.3	44.2	18.0	18.0
Actuated g/C Ratio	0.21	0.21	0.64	0.61	0.25	0.25
v/c Ratio	0.43	0.71	0.67	0.38	0.72	0.32
Control Delay (s/veh)	30.2	9.0	16.1	8.5	31.7	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	30.2	9.0	16.1	8.5	31.7	17.9
LOS	C	A	B	A	C	B
Approach Delay (s/veh)	14.0			11.2	29.2	
Approach LOS	B			B	C	
Queue Length 50th (m)	19.0	0.0	23.1	21.8	40.4	8.1
Queue Length 95th (m)	40.3	26.4	81.5	53.8	76.9	27.5
Internal Link Dist (m)	384.9			268.2	197.4	
Turn Bay Length (m)			120.0			15.0
Base Capacity (vph)	674	884	813	2819	1319	618
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.56	0.56	0.29	0.48	0.22

Intersection Summary

Cycle Length: 95
Actuated Cycle Length: 72.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay (s/veh): 17.0
Intersection LOS: B
Intersection Capacity Utilization 73.5%
ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 6: Dunbrack Street & Washmill Lake Drive



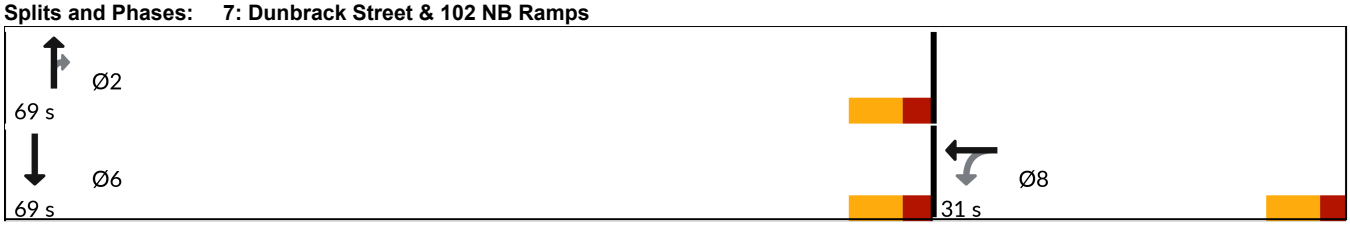
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	110	0	205	0	972	400	0	699	323
Future Volume (vph)	0	0	0	110	0	205	0	972	400	0	699	323
Satd. Flow (prot)	0	0	0	0	1770	1583	0	3539	1583	0	3539	1583
Flt Permitted					0.950							
Satd. Flow (perm)	0	0	0	0	1770	1583	0	3539	1583	0	3539	1583
Satd. Flow (RTOR)						223			435			98
Lane Group Flow (vph)	0	0	0	0	120	223	0	1057	435	0	760	351
Turn Type				Perm	NA	Free		NA	Perm		NA	Free
Protected Phases					8			2			6	
Permitted Phases				8		Free			2			Free
Total Split (s)				31.0	31.0			69.0	69.0		69.0	
Total Lost Time (s)					6.0			6.0	6.0		6.0	
Act Effct Green (s)					9.2	49.3		33.0	33.0		33.0	49.3
Actuated g/C Ratio					0.19	1.00		0.67	0.67		0.67	1.00
v/c Ratio					0.36	0.14		0.45	0.36		0.32	0.22
Control Delay (s/veh)					22.1	0.2		6.7	1.7		5.8	0.3
Queue Delay					0.0	0.0		0.0	0.0		0.0	0.0
Total Delay (s/veh)					22.1	0.2		6.7	1.7		5.8	0.3
LOS					C	A		A	A		A	A
Approach Delay (s/veh)					7.9			5.3			4.1	
Approach LOS					A			A			A	
Queue Length 50th (m)					10.4	0.0		26.6	0.0		17.1	0.0
Queue Length 95th (m)					23.0	0.0		45.9	9.6		30.2	0.0
Internal Link Dist (m)		132.3			115.3			212.7			106.8	
Turn Bay Length (m)						50.0			50.0			15.0
Base Capacity (vph)					923	1583		3539	1583		3539	1583
Starvation Cap Reductn					0	0		0	0		0	0
Spillback Cap Reductn					0	0		0	0		0	0
Storage Cap Reductn					0	0		0	0		0	0
Reduced v/c Ratio					0.13	0.14		0.30	0.27		0.21	0.22

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 49.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.45
Intersection Signal Delay (s/veh): 5.1
Intersection Capacity Utilization 43.0%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 7: Dunbrack Street & 102 NB Ramps

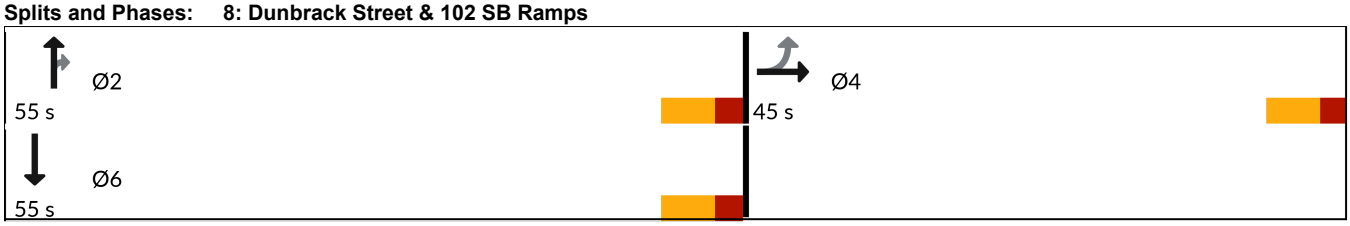


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	40	800	0	0	0	0	972	515	0	386	88
Future Volume (vph)	400	40	800	0	0	0	0	972	515	0	386	88
Satd. Flow (prot)	0	1781	1583	0	0	0	0	3539	1583	0	3539	1583
Flt Permitted		0.956										
Satd. Flow (perm)	0	1781	1583	0	0	0	0	3539	1583	0	3539	1583
Satd. Flow (RTOR)			684						427			98
Lane Group Flow (vph)	0	478	870	0	0	0	0	1057	560	0	420	96
Turn Type	Perm	NA	Free					NA	Perm		NA	Free
Protected Phases		4						2			6	
Permitted Phases	4		Free						2			Free
Total Split (s)	45.0	45.0						55.0	55.0		55.0	
Total Lost Time (s)		6.0						6.0	6.0		6.0	
Act Effct Green (s)		24.1	67.6					30.5	30.5		30.5	67.6
Actuated g/C Ratio		0.36	1.00					0.45	0.45		0.45	1.00
v/c Ratio		0.75	0.55					0.66	0.59		0.26	0.06
Control Delay (s/veh)		28.7	1.4					17.4	6.6		12.6	0.1
Queue Delay		0.0	0.0					0.0	0.0		0.0	0.0
Total Delay (s/veh)		28.7	1.4					17.4	6.6		12.6	0.1
LOS		C	A					B	A		B	A
Approach Delay (s/veh)		11.1						13.6			10.3	
Approach LOS		B						B			B	
Queue Length 50th (m)		52.0	0.0					51.7	9.5		16.3	0.0
Queue Length 95th (m)		113.3	0.0					100.9	42.6		35.2	0.0
Internal Link Dist (m)		147.9			159.2			130.1			212.7	
Turn Bay Length (m)									40.0			55.0
Base Capacity (vph)		1108	1583					2685	1304		2685	1583
Starvation Cap Reductn		0	0					0	0		0	0
Spillback Cap Reductn		0	0					0	0		0	0
Storage Cap Reductn		0	0					0	0		0	0
Reduced v/c Ratio		0.43	0.55					0.39	0.43		0.16	0.06

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 67.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay (s/veh): 12.1
Intersection LOS: B
Intersection Capacity Utilization 66.1%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 8: Dunbrack Street & 102 SB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	0	64	94	0	95	29	165	39	66	181	48
Future Volume (Veh/h)	65	0	64	94	0	95	29	165	39	66	181	48
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	0	70	102	0	103	32	179	42	72	197	52
Pedestrians		20			20						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		2			2						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								253				
pX, platoon unblocked												
vC, conflicting volume	738	692	243	695	697	225	269			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	738	692	243	695	697	225	269			241		
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 %	73	100	91	65	100	87	97			94		
cM capacity (veh/h)	261	327	783	293	325	798	1273			1303		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	71	70	102	103	32	221	72	249
Volume Left	71	0	102	0	32	0	72	0
Volume Right	0	70	0	103	0	42	0	52
cSH	261	783	293	798	1273	1700	1303	1700
Volume to Capacity	0.27	0.09	0.35	0.13	0.03	0.13	0.06	0.15
Queue Length 95th (m)	8.6	2.3	12.1	3.5	0.6	0.0	1.4	0.0
Control Delay (s/veh)	23.9	10.1	23.8	10.2	7.9	0.0	7.9	0.0
Lane LOS	C	B	C	B	A		A	
Approach Delay (s/veh)	17.0		16.9		1.0		1.8	
Approach LOS	C		C					

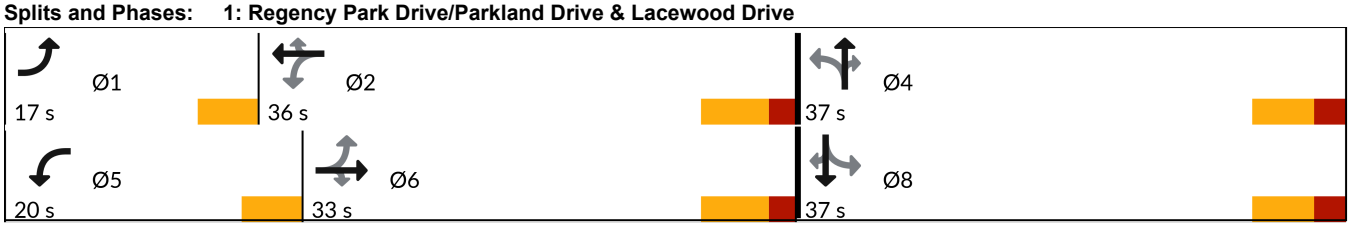
Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	38.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	592	332	336	539	147	288	194	241	133	161	140
Future Volume (vph)	244	592	332	336	539	147	288	194	241	133	161	140
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.409			0.236			0.647			0.610		
Satd. Flow (perm)	745	3539	1460	432	3539	1467	1182	1863	1541	1124	1863	1526
Satd. Flow (RTOR)			114			88			141			99
Lane Group Flow (vph)	265	643	361	365	586	160	313	211	262	145	175	152
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2		2	4		4	8		8
Total Split (s)	17.0	33.0	33.0	20.0	36.0	36.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Lost Time (s)	4.0	6.3	6.3	4.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Act Effct Green (s)	34.3	20.6	20.6	41.2	24.2	24.2	24.7	24.7	24.7	24.7	24.7	24.7
Actuated g/C Ratio	0.44	0.27	0.27	0.53	0.31	0.31	0.32	0.32	0.32	0.32	0.32	0.32
v/c Ratio	0.55	0.68	0.76	0.75	0.53	0.31	0.83	0.36	0.45	0.41	0.29	0.27
Control Delay (s/veh)	15.6	30.2	30.2	23.6	24.7	12.6	45.7	23.1	13.0	25.8	22.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.6	30.2	30.2	23.6	24.7	12.6	45.7	23.1	13.0	25.8	22.3	10.1
LOS	B	C	C	C	C	B	D	C	B	C	C	B
Approach Delay (s/veh)		27.2			22.6			28.7			19.4	
Approach LOS		C			C			C			B	
Queue Length 50th (m)	22.9	50.8	38.3	33.8	42.6	8.7	46.2	25.8	14.3	18.1	21.0	6.0
Queue Length 95th (m)	39.1	71.0	73.3	#74.4	60.8	24.3	#93.9	46.8	36.4	36.8	39.4	20.2
Internal Link Dist (m)		122.8			242.6			314.2			320.2	
Turn Bay Length (m)	55.0		7.0	50.0		7.0	35.0		7.0	35.0		7.0
Base Capacity (vph)	530	1268	596	519	1410	637	487	767	717	463	767	686
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.51	0.61	0.70	0.42	0.25	0.64	0.28	0.37	0.31	0.23	0.22

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 77.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay (s/veh): 25.1
Intersection LOS: C
Intersection Capacity Utilization 83.3%
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: Regency Park Drive/Parkland Drive & Lacewood Drive

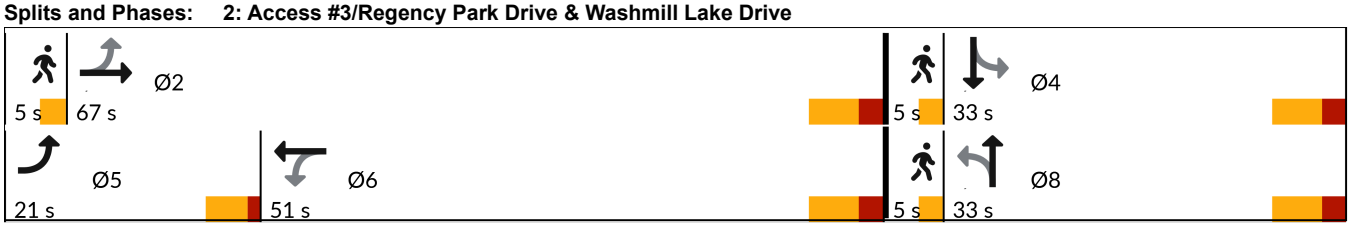


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	918	12	33	824	145	7	22	20	238	37	137
Future Volume (vph)	244	918	12	33	824	145	7	22	20	238	37	137
Satd. Flow (prot)	1770	3529	0	1770	3420	0	0	1724	0	1770	1599	0
Flt Permitted	0.102			0.283				0.952		0.722		
Satd. Flow (perm)	190	3529	0	521	3420	0	0	1649	0	1317	1599	0
Satd. Flow (RTOR)		2			22			22			149	
Lane Group Flow (vph)	265	1011	0	36	1054	0	0	54	0	259	189	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	21.0	67.0		51.0	51.0		33.0	33.0		33.0	33.0	
Total Lost Time (s)	4.5	6.0		6.0	6.0			6.0		6.0	6.0	
Act Effct Green (s)	55.6	49.0		34.8	34.8			24.8		24.8	24.8	
Actuated g/C Ratio	0.58	0.51		0.36	0.36			0.26		0.26	0.26	
v/c Ratio	0.75	0.56		0.19	0.84			0.12		0.76	0.36	
Control Delay (s/veh)	35.3	17.2		24.2	34.7			21.5		51.4	11.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay (s/veh)	35.3	17.2		24.2	34.7			21.5		51.4	11.3	
LOS	D	B		C	C			C		D	B	
Approach Delay (s/veh)		21.0			34.3			21.5			34.5	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	32.4	68.3		4.9	99.8			4.9		48.8	6.2	
Queue Length 95th (m)	#72.6	88.8		13.0	128.9			16.1		#97.8	26.1	
Internal Link Dist (m)		518.2			383.0			43.2			228.7	
Turn Bay Length (m)	20.0			15.0						25.0		
Base Capacity (vph)	385	2277		247	1639			486		376	562	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.69	0.44		0.15	0.64			0.11		0.69	0.34	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 96.2
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.84
Intersection Signal Delay (s/veh): 28.2
Intersection LOS: C
Intersection Capacity Utilization 74.8%
ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Access #3/Regency Park Drive & Washmill Lake Drive



Lane Group	Ø1	Ø3	Ø7
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Satd. Flow (RTOR)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	3	7
Permitted Phases			
Total Split (s)	5.0	5.0	5.0
Total Lost Time (s)			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay (s/veh)			
Queue Delay			
Total Delay (s/veh)			
LOS			
Approach Delay (s/veh)			
Approach LOS			
Queue Length 50th (m)			
Queue Length 95th (m)			
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

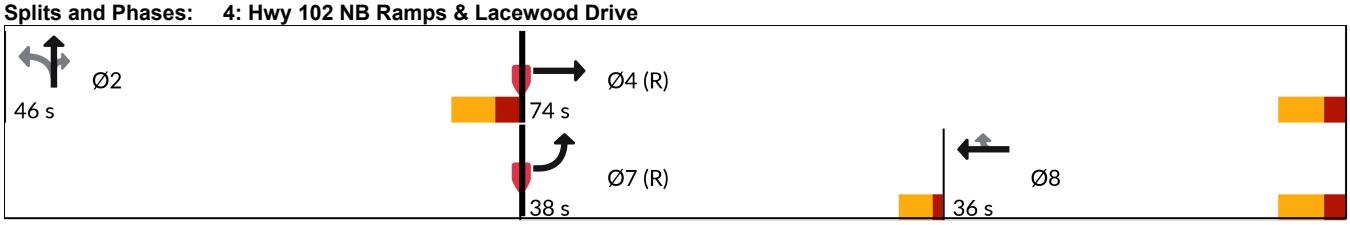
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	790	951	0	0	965	407	305	5	536	0	0	0
Future Volume (vph)	790	951	0	0	965	407	305	5	536	0	0	0
Satd. Flow (prot)	3433	3539	0	0	5085	1583	1681	1688	1583	0	0	0
Flt Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	3433	3539	0	0	5085	1583	1681	1688	1583	0	0	0
Satd. Flow (RTOR)						391			89			
Lane Group Flow (vph)	859	1034	0	0	1049	442	169	168	583	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Total Split (s)	38.0	74.0			36.0	36.0	46.0	46.0	46.0			
Total Lost Time (s)	4.0	6.0			6.0	6.0	6.0	6.0	6.0			
Act Effct Green (s)	33.9	67.3			29.4	29.4	40.7	40.7	40.7			
Actuated g/C Ratio	0.28	0.56			0.25	0.25	0.34	0.34	0.34			
v/c Ratio	0.89	0.52			0.84	0.65	0.30	0.29	0.98			
Control Delay (s/veh)	24.3	8.7			50.3	11.0	31.2	31.1	66.1			
Queue Delay	6.4	0.9			0.4	0.0	0.0	0.0	0.0			
Total Delay (s/veh)	30.7	9.6			50.7	11.0	31.2	31.1	66.1			
LOS	C	A			D	B	C	C	E			
Approach Delay (s/veh)		19.2			38.9			53.3				
Approach LOS		B			D			D				
Queue Length 50th (m)	118.1	90.2			90.4	9.9	32.5	32.3	126.8			
Queue Length 95th (m)	#139.7	0.0			108.3	43.4	52.5	52.4	#205.9			
Internal Link Dist (m)		118.1			149.0			197.6			197.9	
Turn Bay Length (m)						60.0			60.0			
Base Capacity (vph)	977	2005			1277	690	570	572	596			
Starvation Cap Reductn	87	629			0	0	0	0	0			
Spillback Cap Reductn	0	0			35	0	1	1	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.97	0.75			0.84	0.64	0.30	0.29	0.98			

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 61 (51%), Referenced to phase 4:EBT and 7:EBL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay (s/veh): 33.3 Intersection LOS: C
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Hwy 102 NB Ramps & Lacewood Drive

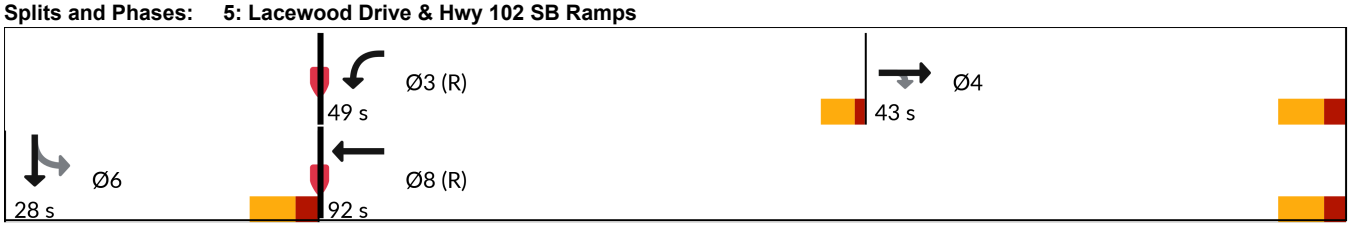


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1409	300	383	887	0	0	0	0	332	0	530
Future Volume (vph)	0	1409	300	383	887	0	0	0	0	332	0	530
Satd. Flow (prot)	0	6408	1583	1770	3539	0	0	0	0	1681	1681	1583
Flt Permitted				0.950						0.950	0.950	
Satd. Flow (perm)	0	6408	1490	1761	3539	0	0	0	0	1681	1681	1583
Satd. Flow (RTOR)			310									378
Lane Group Flow (vph)	0	1532	326	416	964	0	0	0	0	180	181	576
Turn Type		NA	Perm	Prot	NA					Perm	NA	Free
Protected Phases		4		3	8						6	
Permitted Phases			4							6		Free
Total Split (s)		43.0	43.0	49.0	92.0					28.0	28.0	
Total Lost Time (s)		6.0	6.0	4.0	6.0					6.0	6.0	
Act Effct Green (s)		37.6	37.6	48.9	90.4					17.6	17.6	120.0
Actuated g/C Ratio		0.31	0.31	0.41	0.75					0.15	0.15	1.00
v/c Ratio		0.76	0.48	0.58	0.36					0.73	0.74	0.36
Control Delay (s/veh)		39.9	6.6	8.0	2.4					66.0	66.3	0.6
Queue Delay		0.2	0.0	1.6	0.4					0.0	0.0	0.0
Total Delay (s/veh)		40.1	6.6	9.6	2.7					66.0	66.3	0.6
LOS		D	A	A	A					E	E	A
Approach Delay (s/veh)		34.2			4.8						25.9	
Approach LOS		C			A						C	
Queue Length 50th (m)		97.1	2.7	11.4	0.0					45.2	45.4	0.0
Queue Length 95th (m)		111.8	24.9	m134.9	100.3					69.5	69.8	0.0
Internal Link Dist (m)		108.2			118.1			188.6			191.5	
Turn Bay Length (m)			70.0									90.0
Base Capacity (vph)		2070	691	736	2667					308	308	1583
Starvation Cap Reductn		0	0	166	1027					0	0	0
Spillback Cap Reductn		109	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.78	0.47	0.73	0.59					0.58	0.59	0.36

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 3:WBL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay (s/veh): 22.6 Intersection LOS: C
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Lacewood Drive & Hwy 102 SB Ramps

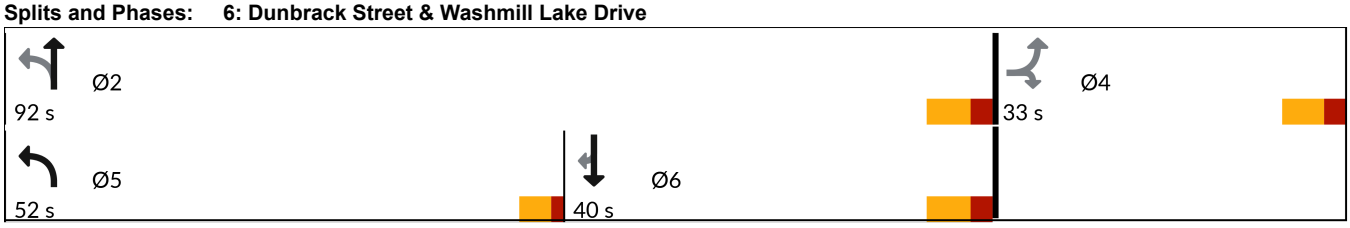


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	181	651	612	785	830	217
Future Volume (vph)	181	651	612	785	830	217
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.111			
Satd. Flow (perm)	1770	1583	207	3539	3539	1543
Satd. Flow (RTOR)		643				57
Lane Group Flow (vph)	197	708	665	853	902	236
Turn Type	Perm	Perm	pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4	4	2			6
Total Split (s)	33.0	33.0	52.0	92.0	40.0	40.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Act Effct Green (s)	18.9	18.9	81.8	79.8	31.9	31.9
Actuated g/C Ratio	0.17	0.17	0.74	0.72	0.29	0.29
v/c Ratio	0.66	0.88	0.86	0.34	0.89	0.49
Control Delay (s/veh)	54.9	19.7	37.9	6.7	50.8	30.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	54.9	19.7	37.9	6.7	50.8	30.3
LOS	D	B	D	A	D	C
Approach Delay (s/veh)	27.4			20.3	46.6	
Approach LOS	C			C	D	
Queue Length 50th (m)	45.3	13.9	119.7	32.8	109.0	35.3
Queue Length 95th (m)	70.6	#74.5	#214.0	53.8	#161.0	66.1
Internal Link Dist (m)	384.9			268.2	197.4	
Turn Bay Length (m)			120.0			15.0
Base Capacity (vph)	441	877	844	2779	1110	523
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.81	0.79	0.31	0.81	0.45

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 110.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay (s/veh): 30.5 Intersection LOS: C
Intersection Capacity Utilization 80.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Dunbrack Street & Washmill Lake Drive

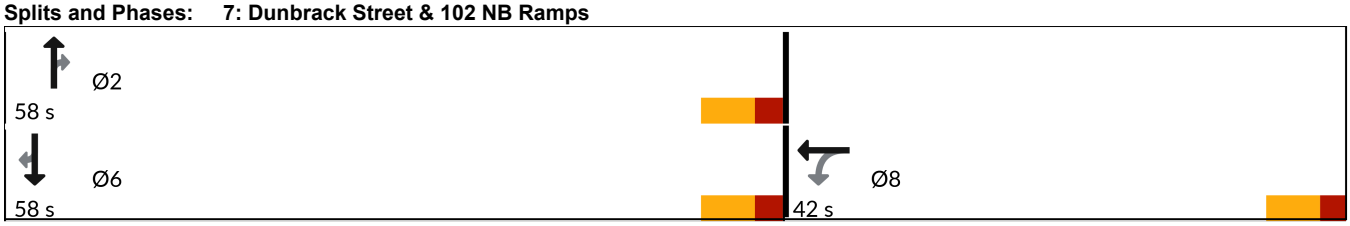


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	245	0	480	0	947	420	0	1070	421
Future Volume (vph)	0	0	0	245	0	480	0	947	420	0	1070	421
Satd. Flow (prot)	0	0	0	0	1770	1583	0	3539	1583	0	3539	1583
Flt Permitted					0.950							
Satd. Flow (perm)	0	0	0	0	1770	1583	0	3539	1583	0	3539	1583
Satd. Flow (RTOR)						493			457			161
Lane Group Flow (vph)	0	0	0	0	266	522	0	1029	457	0	1163	458
Turn Type				Perm	NA	Free		NA	Perm		NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8		Free			2			6
Total Split (s)				42.0	42.0			58.0	58.0		58.0	58.0
Total Lost Time (s)					6.0			6.0	6.0		6.0	6.0
Act Effct Green (s)					15.0	56.4		28.9	28.9		28.9	28.9
Actuated g/C Ratio					0.27	1.00		0.51	0.51		0.51	0.51
v/c Ratio					0.57	0.33		0.57	0.44		0.64	0.52
Control Delay (s/veh)					24.1	0.6		11.2	2.5		12.3	8.4
Queue Delay					0.0	0.0		0.0	0.0		0.0	0.0
Total Delay (s/veh)					24.1	0.6		11.2	2.5		12.3	8.4
LOS					C	A		B	A		B	A
Approach Delay (s/veh)					8.5			8.6			11.2	
Approach LOS					A			A			B	
Queue Length 50th (m)					23.0	0.0		34.7	0.0		41.4	16.6
Queue Length 95th (m)					55.4	0.0		67.0	12.6		79.4	47.5
Internal Link Dist (m)		132.3			115.3			212.7			106.8	
Turn Bay Length (m)						50.0			50.0			15.0
Base Capacity (vph)					1178	1583		3182	1469		3182	1439
Starvation Cap Reductn					0	0		0	0		0	0
Spillback Cap Reductn					0	0		0	0		0	0
Storage Cap Reductn					0	0		0	0		0	0
Reduced v/c Ratio					0.23	0.33		0.32	0.31		0.37	0.32

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 56.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay (s/veh): 9.6
Intersection LOS: A
Intersection Capacity Utilization 53.2%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 7: Dunbrack Street & 102 NB Ramps

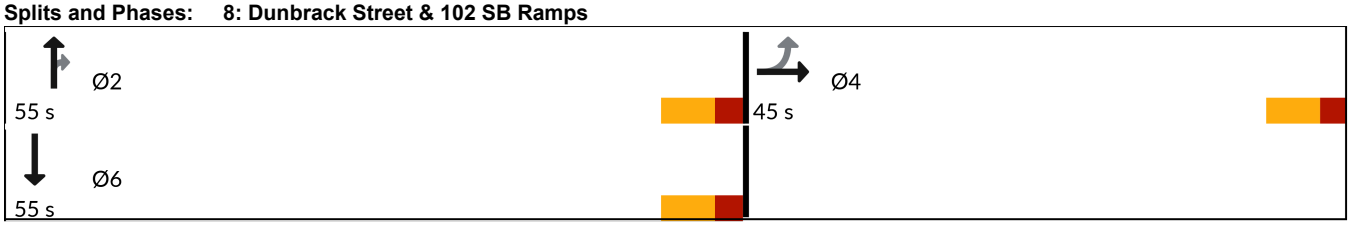


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	0	735	0	0	0	0	1057	110	0	1054	86
Future Volume (vph)	315	0	735	0	0	0	0	1057	110	0	1054	86
Satd. Flow (prot)	0	1770	1583	0	0	0	0	3539	1583	0	3539	1583
Flt Permitted		0.950										
Satd. Flow (perm)	0	1770	1583	0	0	0	0	3539	1583	0	3539	1583
Satd. Flow (RTOR)			510						84			98
Lane Group Flow (vph)	0	342	799	0	0	0	0	1149	120	0	1146	93
Turn Type	Perm	NA	Free					NA	Perm		NA	Free
Protected Phases		4						2			6	
Permitted Phases	4		Free						2			Free
Total Split (s)	45.0	45.0						55.0	55.0		55.0	
Total Lost Time (s)		6.0						6.0	6.0		6.0	
Act Effct Green (s)		17.8	57.0					26.4	26.4		26.4	57.0
Actuated g/C Ratio		0.31	1.00					0.46	0.46		0.46	1.00
v/c Ratio		0.62	0.50					0.70	0.15		0.70	0.06
Control Delay (s/veh)		23.4	1.2					15.2	4.7		15.2	0.1
Queue Delay		0.0	0.0					0.0	0.0		0.0	0.0
Total Delay (s/veh)		23.4	1.2					15.2	4.7		15.2	0.1
LOS		C	A					B	A		B	A
Approach Delay (s/veh)		7.8						14.2			14.0	
Approach LOS		A						B			B	
Queue Length 50th (m)		29.6	0.0					46.0	1.9		45.8	0.0
Queue Length 95th (m)		70.2	0.0					90.5	11.1		89.9	0.0
Internal Link Dist (m)		147.9			159.2			130.1			212.7	
Turn Bay Length (m)									40.0			55.0
Base Capacity (vph)		1290	1583					3025	1365		3025	1583
Starvation Cap Reductn		0	0					0	0		0	0
Spillback Cap Reductn		0	0					0	0		0	0
Storage Cap Reductn		0	0					0	0		0	0
Reduced v/c Ratio		0.27	0.50					0.38	0.09		0.38	0.06

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 57
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay (s/veh): 12.1
Intersection LOS: B
Intersection Capacity Utilization 56.7%
ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 8: Dunbrack Street & 102 SB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	0	88	120	0	122	65	257	90	150	203	108
Future Volume (Veh/h)	89	0	88	120	0	122	65	257	90	150	203	108
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	0	96	130	0	133	71	279	98	163	221	117
Pedestrians		20			20						20	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		2			2						2	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								253				
pX, platoon unblocked	0.97	0.97		0.97	0.97	0.97				0.97		
vC, conflicting volume	1200	1165	300	1133	1174	368	358			397		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1190	1154	300	1122	1164	333	358			363		
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 %	5	100	87	0	100	80	94			86		
cM capacity (veh/h)	102	149	728	126	147	665	1181			1140		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	97	96	130	133	71	377	163	338
Volume Left	97	0	130	0	71	0	163	0
Volume Right	0	96	0	133	0	98	0	117
cSH	102	728	126	665	1181	1700	1140	1700
Volume to Capacity	0.95	0.13	1.03	0.20	0.06	0.22	0.14	0.20
Queue Length 95th (m)	45.6	3.6	58.0	5.9	1.5	0.0	4.0	0.0
Control Delay (s/veh)	151.4	10.7	156.5	11.8	8.2	0.0	8.7	0.0
Lane LOS	F	B	F	B	A		A	
Approach Delay (s/veh)	81.4		83.3		1.3		2.8	
Approach LOS	F		F					

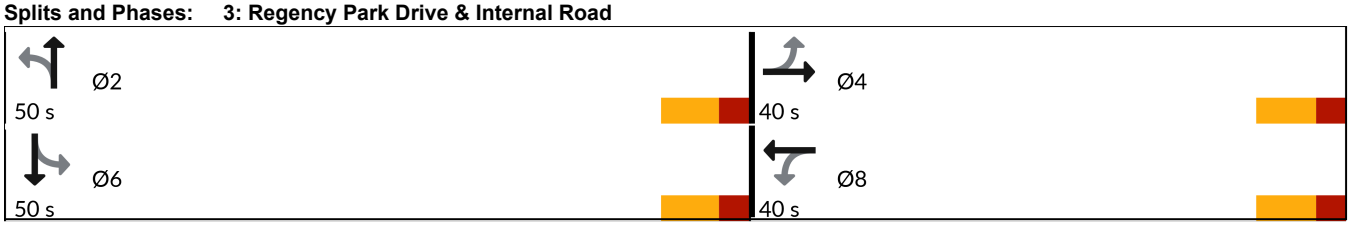
Intersection Summary				
Average Delay	28.2			
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	0	64	94	0	95	29	165	39	66	181	48
Future Volume (vph)	65	0	64	94	0	95	29	165	39	66	181	48
Satd. Flow (prot)	1770	1583	0	1770	1532	0	1770	1785	0	1770	1779	0
Flt Permitted	0.690			0.711			0.605			0.620		
Satd. Flow (perm)	1271	1583	0	1324	1532	0	1089	1785	0	1113	1779	0
Satd. Flow (RTOR)		586			615			18			21	
Lane Group Flow (vph)	71	70	0	102	103	0	32	221	0	72	249	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Act Effct Green (s)	8.9	8.9		9.0	9.0		15.1	15.1		15.1	15.1	
Actuated g/C Ratio	0.27	0.27		0.28	0.28		0.47	0.47		0.47	0.47	
v/c Ratio	0.20	0.08		0.28	0.12		0.06	0.26		0.14	0.30	
Control Delay (s/veh)	10.8	0.2		11.5	0.3		8.9	9.1		9.5	9.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	10.8	0.2		11.5	0.3		8.9	9.1		9.5	9.3	
LOS	B	A		B	A		A	A		A	A	
Approach Delay (s/veh)		5.5			5.9			9.1			9.3	
Approach LOS		A			A			A			A	
Queue Length 50th (m)	2.5	0.0		3.7	0.0		1.0	7.0		2.4	8.0	
Queue Length 95th (m)	10.6	0.0		14.2	0.0		6.0	25.1		11.0	28.2	
Internal Link Dist (m)		56.4			112.1			228.7			319.3	
Turn Bay Length (m)	25.0			25.0			25.0			25.0		
Base Capacity (vph)	1197	1525		1247	1478		1071	1755		1094	1750	
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	0.06	0.05		0.08	0.07		0.03	0.13		0.07	0.14	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 32.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.30
Intersection Signal Delay (s/veh): 7.9
Intersection LOS: A
Intersection Capacity Utilization 45.4%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Regency Park Drive & Internal Road

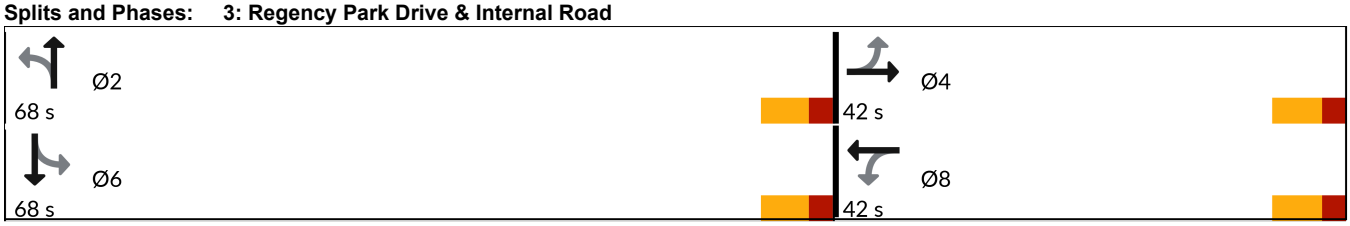


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	0	88	120	0	122	65	257	90	150	203	108
Future Volume (vph)	89	0	88	120	0	122	65	257	90	150	203	108
Satd. Flow (prot)	1770	1528	0	1770	1481	0	1770	1753	0	1770	1717	0
Flt Permitted	0.672			0.695			0.557			0.538		
Satd. Flow (perm)	1204	1528	0	1277	1481	0	1004	1753	0	973	1717	0
Satd. Flow (RTOR)		604			528			26			40	
Lane Group Flow (vph)	97	96	0	130	133	0	71	377	0	163	338	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	42.0	42.0		42.0	42.0		68.0	68.0		68.0	68.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Act Effct Green (s)	10.2	10.2		10.2	10.2		14.8	14.8		14.8	14.8	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.40	0.40		0.40	0.40	
v/c Ratio	0.30	0.11		0.37	0.17		0.18	0.53		0.42	0.48	
Control Delay (s/veh)	13.7	0.3		14.7	0.5		9.6	11.9		13.3	10.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	13.7	0.3		14.7	0.5		9.6	11.9		13.3	10.7	
LOS	B	A		B	A		A	B		B	B	
Approach Delay (s/veh)		7.0			7.5			11.5			11.5	
Approach LOS		A			A			B			B	
Queue Length 50th (m)	4.4	0.0		6.0	0.0		2.6	14.9		6.6	12.2	
Queue Length 95th (m)	15.5	0.0		19.7	0.0		10.8	43.7		23.7	37.2	
Internal Link Dist (m)		56.4			112.1			228.7			319.3	
Turn Bay Length (m)	25.0			25.0			25.0			25.0		
Base Capacity (vph)	1120	1464		1188	1415		1004	1753		973	1717	
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	0.09	0.07		0.11	0.09		0.07	0.22		0.17	0.20	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 37.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay (s/veh): 10.2
Intersection LOS: B
Intersection Capacity Utilization 64.1%
ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: Regency Park Drive & Internal Road



4: Hwy 102 NB Ramps & Lacewood Drive Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.7	1.7	1.1	1.5	3.1	0.8
Total Del/Veh (s)	16.0	8.2	42.9	20.8	44.6	38.1	31.0	25.4

Intersection: 4: Hwy 102 NB Ramps & Lacewood Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B11	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	R	T	L	LT	R
Maximum Queue (m)	99.3	106.5	89.7	92.7	98.1	94.9	108.0	67.5	70.7	134.5	174.6	67.5
Average Queue (m)	37.4	41.0	28.3	31.0	67.0	59.6	57.4	48.4	2.5	21.4	81.1	57.8
95th Queue (m)	84.5	90.5	67.9	72.5	96.2	86.6	93.0	77.2	33.4	91.0	149.3	81.9
Link Distance (m)	126.0	126.0	126.0	126.0	149.5	149.5	149.5		127.1	204.9	204.9	
Upstream Blk Time (%)	0	0	0	0					0		0	
Queuing Penalty (veh)	0	0	0	1					0		0	
Storage Bay Dist (m)								60.0				60.0
Storage Blk Time (%)							5	3			8	11
Queuing Penalty (veh)							21	10			13	23

3: Regency Park Drive & Internal Road Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	3.8	0.4	3.7	0.5	0.0	0.0	0.0	2.8	0.6	0.6	1.1
Total Del/Veh (s)	19.5	5.7	20.6	7.3	5.0	2.6	1.7	5.6	2.7	1.7	6.3

Intersection: 3: Regency Park Drive & Internal Road

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (m)	28.2	33.1	30.0	37.6	15.5	13.2	23.4	19.9
Average Queue (m)	13.0	11.5	15.4	13.3	5.1	1.1	10.3	2.0
95th Queue (m)	24.1	22.0	26.8	27.9	13.5	6.6	20.2	10.7
Link Distance (m)		70.0		125.7		228.6		332.9
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	25.0		25.0		25.0		25.0	
Storage Blk Time (%)	2	0	4	0	0	0	0	0
Queuing Penalty (veh)	2	0	5	0	0	0	1	0